American Aviation

MANAGEMENT
ENGINEERING
PRODUCTION
OPERATIONS
MAINTENANCE
EQUIPMENT

REFERENCE CO
Oct. 11
1954
RECEIVED
8 OCT 1954
ARMY LIBRARY
SERIAL RECORD

Ed Heinemann . . Designer by Intuition 34

★

What Now In Europe? 15

★

Another Round of Piston Engine Transports . 19

★

Airline Subsidy Bill Drops $1 Million . . 26

★

Russia Basing Diesels Within Reach of U. S. 29

50 cents

Here it is, wearing the Honeywell label

Better engine control for the jet age

As ENGINES become more powerful, as planes fly faster and farther, the demand for a *better* engine control system has to be met.

The new Honeywell electro-mechanical control is such a system. It makes it possible to accelerate a cold turbojet engine to full augmented thrust 30 to 45 seconds faster. The new fully automatic system takes much of the burden off the human pilot, and at the same time operates the engine at maximum efficiency under constantly changing conditions.

The new Honeywell engine control is a co-ordinated automatic electro-mechanical system. It utilizes the speed and sensitivity of electrical computers to position the mechanical control elements of the engine.

Because this new self-adjusting system *senses* conditions within the engine, it can give more accurate control and faster response than any purely mechanical system.

Weighing under 70 pounds, the new Honeywell system is a flexible system adaptable to any turbojet engine.

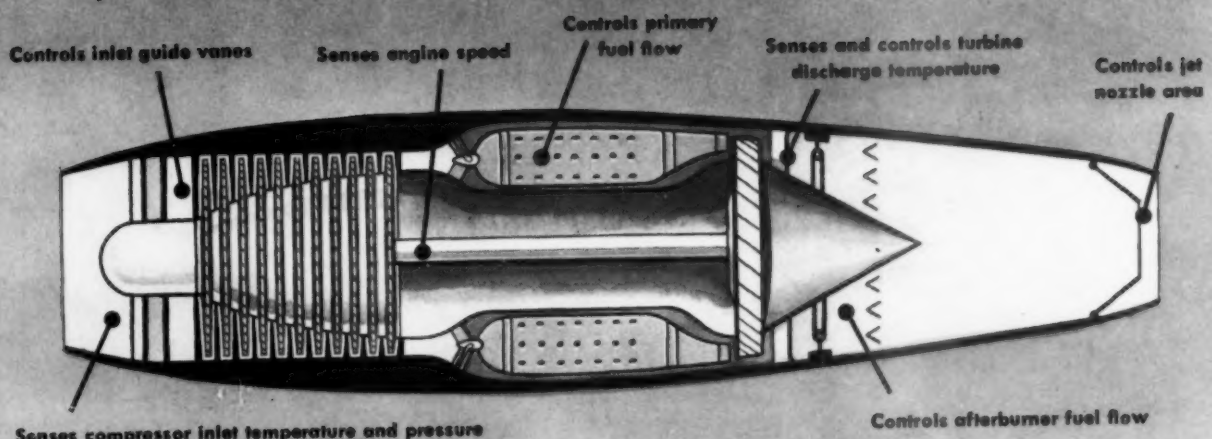
The new engine control system is another new development from Honeywell. There'll be more, for automatic control is so important to aviation's progress. And *automatic control* is Honeywell's business.

MINNEAPOLIS **Honeywell**

Aeronautical Division

2600 Ridgway Road, Minneapolis 13, Minn.

What the new Honeywell system does


Controls inlet guide vanes
Senses engine speed
Controls primary fuel flow
Senses and controls turbine discharge temperature
Controls jet nozzle area
Senses compressor inlet temperature and pressure
Controls afterburner fuel flow

AIRTRENDS Washington, D. C., Oct. 11, 1954

THE BATTLE OF THE DEFENSE BUDGET is underway. Defense Department was to have gotten the Fiscal 1956 budget to the Administration within the past few days. Anticipating a budget-conscious attitude toward Defense spending, each of the services has opened fire to gain public support for its requirements. Everyone is using the atom to serve his own cause:

THE ARMY: Potential atomic attack requires a new concept in battlefield tactics. More manpower is needed, not less. An atomic bomb can wipe out a large troop concentration. Battle areas will be larger, troops must be dispersed accordingly.

Army rolled out its big guns for this battle: Army Secretary Robert T. Stevens and Chief of Staff Matthew B. Ridgway first put their case to President Eisenhower in Denver, then told the story to the press.

THE NAVY: This country's atomic air armada requires logistic support only possible through control of the seas. A stronger Navy is the only answer. Part of these shipments will include atomic weapons and their safe delivery must be protected by atomic-age ships in a modernized Navy.

Navy was equally fortunate in its choice of spokesmen. Both Admiral Arthur W. Radford, chairman of the Joint Chiefs of Staff, and Admiral Robert B. Carney, Chief of Naval Operations, spoke out for the Navy's needs.

MARINE CORPS: On a smaller scale the USMC's Gen. Lemuel C. Shepherd, Jr. outlined the tactical promise of helicopters and other contributions to amphibious warfare. But, say the Marines, the equipment is not at hand for the job.

AIR FORCE: Busy defending the USAF's modernization and expansion, the Air Force has been relatively quiet. Most outspoken comment (by Gen. Thomas D. White, Vice Chief of Staff): "Today the safety of the nation depends on better airplanes. . . . If aggressor air power continues to grow, our Air Force must grow, too. Thus any departure from the steady level of demand will be upward."

Unofficial but effective support for USAF growth came from former Air Secretary Thomas K. Finletter in his newly released book "Power and Policy." Finletter called for at least $6 billion more USAF funds for fiscal 1956 than in the current year if U. S. air superiority is to be maintained.

NEWS at DEADLINE

The Howard Hughes empire, worth an estimated $400 million, is rumored to be up for sale, with the president of Twentieth Century-Fox pictures, Spyros Skouras, seen as the buyer. Skouras is said to be a member of a purchasing syndicate which includes Laurance S. Rockefeller, New York real estate man William Zeckendorf, and Greek shipping magnate Aristotles Onassis. Hughes' holdings include RKO-Radio Pictures, the Hughes Aircraft Co., and part of Trans World Airlines.

Chrysler Awarded Redstone Missile Contracts Worth $22 Million

Army says limited production of ground-to-ground missile due to begin soon

Army contracts totaling more than $22 million have been awarded to Chrysler Corp. for development and production of the Redstone guided missile, the Army announced recently.

Most recent award on this project was $855,000 made late last month. The Army termed this "the final touch needed to start limited production of the Redstone." Last June, Chrysler received $8,661,000.

Chrysler's first venture into the missile field, the project is underway in a portion of the Navy-owned jet engine plant at Warren, Mich., located in the Detroit metropolitan area. Total funds for preparatory work in tooling up for production has mounted to $2,275,000, the Army reported.

The Redstone, named for Redstone Arsenal, Ala., is a long-range, ground-to-ground missile powered by a rocket engine produced by North American Aviation, Inc.

Bendix C-Band Radar

Bendix Radio Communications Division has broadened its competitive position in the field of commercial airborne weather radar with the announcement of plans to produce a C-Band version of its RDR-1 weather penetration radar equipment. First unit to be produced has been ordered by United Air Lines for evaluation and will be delivered in January 1955.

The new radar, designated the RDR-1C, supplements the earlier announced Bendix RDR-1A (standard X-Band radar) and RDR-1B (standard X-Band with beacon). Production on the latter two types is scheduled to begin late this month, whereas that of the new RDR-1C has not yet been finalized.

Rentzel Takes Slick Post

Delos W. Rentzel, former top Government official, will become chairman of Slick Airways' board of directors, according to a letter circulated to employees by Slick v. p. Joseph F. Grant. The move is conditioned upon CAB approving an agreement under which Flying Tigers would withdraw from the cargo field and Slick would continue with planes leased from FTL.

Rentzel has stated he will not sever his connections with an Oklahoma trucking concern and that his affiliation with Slick would be part-time. Slick, meanwhile, has proposed pay reductions of 20% for pilots, 15% for co-pilots, and 5-20% for other employees, depending upon earnings. No employees making under $300 a month would be asked to take a cut.

Bell Steps Down

Lawrence D. Bell has stepped down from his post as general manager of Bell Aircraft Company "to devote his entire attention to his duties as president," it has been announced. Leston P. Faneuf has been named general manager, having served as assistant general manager, secretary, and treasurer. He will continue as treasurer with William G. Gisel, comptroller, taking over the secretaryship.

Doman Takes New Post

Glidden S. Doman, president and chairman of the board of Doman Helicopters, Inc., has relinquished the presidency to Donald S. B. Waters, formerly financial assistant to the vice president and general manager of Kaiser Metal Products, Inc. Doman, concurrently elected to the newly created post of vice president-engineering, "will devote his full time to technical activities."

USAF Orders Javelins

A U. S. off-shore procurement order has been placed for a quantity of Gloster Javelin all-weather fighters for delivery in early 1957. It is part of $103 million worth of contracts placed with British manufacturers by USAF headquarters in Europe for additional Hawker Hunters, engines, and ammunition. No breakdown between the four portions of the $103 million is available.

The Javelin is the second all-weather fighter to be ordered from a European manufacturer under the U. S. off-shore procurement program. The first was the North American F-86K which is to be built under license in Italy by Fiat.

Navy Releases TACAN Data

The military TACAN short-range navigation system is an integrated bearing and distance-indicating system having greater accuracy than civil VOR but less accuracy than civil DME, according to the first information authorized for release by the U. S. Navy.

In a recent statement read by Col. J. Francis Taylor, Air Navigation Development Board Director, before the Radio Technical Commission for Aeronautics fall assembly in Washington, D. C., weight of the TACAN system was placed at 85 pounds and dimensions at ¾ ATR rack size.

According to the Navy, other advantages of TACAN include its requirement for less airborne equipment (only one antenna), and a ground installation that is less critical to siting requirements. Overall system performance calls for line-of-sight range of 200 nautical miles.

Hackney Resigns

L. R. "Mike" Hackney has resigned as executive vice president of Transport Air Group effective October 15. In his letter of resignation Hackney urged TAG directors to give serious consideration to merging with Independent Military Air Transport Association.

A New Concept in Flight

The powerful Capital Viscount* is the first and only modern propeller aircraft to combine swiftness with the highest degree of silence and smoothness. The four Rolls-Royce propeller turbine (turbo-prop) engines introduce the traveler to an ease and comfort in flight that transforms air travel into something *more than a race against time*. Panoramic picture windows . . . individual tables . . . air-conditioning and pressurization . . . contribute to this new kind of luxury. The Viscount, which comes to Capital with over one hundred million passenger hours of safe operation, will be serving Capital cities soon. Watch for the announcement!

* Pronounced Vi-Count

Capital Airlines VISCOUNT

POWERED BY ROLLS-ROYCE

ROLLS RR ROYCE

SWIFT, SMOOTH, SILENT, SURE

The Otter
IN THE SERVICE OF THE R.C.A.F.
Although the Otter carries twice the payload for much longer ranges . . . it still duplicates the outstanding performance of the world famous Beaver (L20).
★ Now in Quantity Production for Commercial Operators and the Royal Canadian Air Force.
DS412A
DESIGNED AND MANUFACTURED BY
THE DE HAVILLAND AIRCRAFT OF CANADA LIMITED
POSTAL STATION "L" TORONTO ONTARIO

WORLD'S PREMIER AIRPLANE FABRIC

lighter - - - - stronger - - - - - smoother

FLIGHTEX

FLIGHTEX FABRICS, Inc. • 93 WORTH STREET • NEW YORK 13, N. Y.

Leading Manufacturers of Fabric and Tapes for the Aircraft Industry.

FLIGHTEX FABRIC

Export Representative AVIQUIPO, Inc. 25 Beaver Street, N. Y. Cable: Aviquipo

Letters

Throttle Back on Speed

To the Editor:

I noticed in your *Airline Commentary*, in remarking of Capital Airlines: "A new concept in flight which transforms air travel into something more than just a race against time."

Whether this remark is yours or Capital Airlines is immaterial; I'm glad it has been said. Perhaps the words "and one's competitors" might even be added.

It is high time that the accent on speed be throttled back, and more throttle be applied to safety, comfort, noise, and economical operation. Let speed rest for awhile and let these other four factors catch up; then speed can be resumed when it is needed.

As for safety, the greatest factor of all, I sometimes wonder if it gets all the attention it should—whether there is more talk than concentrated action.

This recent mishap of the KLM in the Shannon River of Ireland is causing laymen in the streets to ask "Where were the escape hatches on this plane and why weren't they opened to let fresh air in and the fumes and passengers out? Was the crew supplied with emergency battery lamps and, if so, why weren't they using them?"

You can't blame laymen for asking questions like this. I've been around aviation since 1927 and even I think it is strange that in 1954 a group of people, slightly bruised perhaps, but very much alive, should be asphyxiated in their seats in a plane on the waters of a shallow, calm river, and all in the dark except for the solitary flashlight of a passenger.

The above safety factors seem like small items in a plane. But there are no small safety items in a plane. The smallest is as important as the largest.

Let us keep the lights focused on safety 'round the clock, and may they never grow dim, regardless of other factors.

WILLIAM E. SILVERTHORNE, JR.
Int'l Air Transportation Consultant
New York City, New York

The Mallard Story

To the Editor:

I think you did a fine job in your somewhat different approach on the Mallard story in the September 13th issue of AMERICAN AVIATION.

I don't believe that even a word changed would improve the article.

D. A. PETERSON
Mallard Industries, Inc.
Stratford, Connecticut

Proud Williamsport

To the Editor:

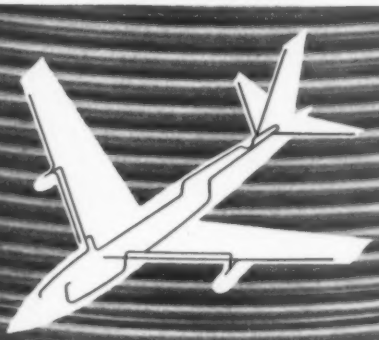
On behalf of our community I would like to express our sincere appreciation for the fine story by Walter Kilrain in your September 13th issue.

I am sure that the citizens of Williamsport appreciate the splendid service in air travel that the airlines give our city and we are proud of the part we are playing in the progress of this type of transportation.

LEO C. WILLIAMSON
Lycoming Division
AVCO Manufacturing Corporation
Williamsport, Pa.

SOLA-FLEX®

AIRCRAFT BELLOWS



Make Solar your source for bellows and pneumatic ducting systems

FOR AIRCRAFT BELLOWS, hot air ducting components or complete pneumatic systems, Solar is your logical supplier.

Sola-Flex bellows are known for their reliability. Over one million have been built, for a variety of airborne applications. Standard types are available "off the shelf" . . . special designs take a little longer.

Solar-made hot air ducting components are used on many of America's military and commercial aircraft. Solar's long experience in fabricating alloy steels is an important plus-factor in producing finer systems.

Solar is an integrated source for all your pneumatic system requirements—both experimental and production. Experienced Solar engineers are ready to work with you at any stage in developing complete aircraft ducting systems.

SOLAR AIRCRAFT COMPANY

SAN DIEGO
DES MOINES

This is What Solar Offers You

Solar specializes in the manufacture of precision products from alloys and special metals for severe service. Solar's experience since 1927 is unduplicated in this field. Solar skills and facilities range from research, design and development through to mass production. Wherever heat, corrosion or difficult specifications are problems, Solar can help you solve them.

PLANTS. *In San Diego (Photo above) and Des Moines. A total of 1,400,900 sq. ft. floor space. Approximately 5,000 employees. Annual sales over $65,000,000.*

EQUIPMENT. *Production equipment for all types of metal fabrication—forming, machining, welding, brazing, casting, coating. Extensive laboratory and testing equipment. Facilities for development, prototype, limited or mass production.*

SERVICES. *Research, design, development, tooling and production engineering staffs. Experienced with all alloy steels, stainless alloys, super alloys, and titanium and its alloys. Government source inspection and Solar quality control meet rigid aircraft and commercial standards.*

CONTRACT PRODUCTION

Current orders include aircraft engine and airframe parts, alloy castings, pneumatic ducting, atomic energy components. Customers include some of the most honored names among aircraft and industrial companies in the U.S. and Europe.

SPECIAL PRODUCTS

Bellows. *"Sola-Flex"® bellows and expansion joints in many designs from ½ in. up to the world's largest, 28 ft. in diameter.*

Gas Turbines. *Solar "Mars" 50 hp engines for auxiliary generator sets, ground carts, portable fire pumps; Solar "Jupiter" 500 hp engines in variable and constant speed models.*

Ceramic Coatings. *"Solaramic"® is the Solar trade mark for a family of coatings that protects metals from heat, corrosion, galling and abrasion.*

Controls. *Complete control systems utilizing the new Solar "Microjet"® principle for control of gas turbines, jet engines and pneumatic devices.*

FURTHER INFORMATION

Your inquiry regarding any Solar service or facility will receive prompt attention. Address Solar Aircraft Company, Department A-31, San Diego 12, California.

"Required Reading"

To the Editor:

I had intended to write earlier expressing my appreciation on behalf of Allegheny for the article appearing in the September 13th issue of AMERICAN AVIATION. As it has turned out, however, I am glad I waited.

I was in Williamsport on Friday of last week. Everyone was terrifically pleased over Williamsport playing a prominent part in Walter Kilrain's article. It might interest you to know that the Manufacturers Association in Williamsport is distributing 150 copies of the magazine throughout its organization as "required reading material."

From Allegheny's standpoint, Kilrain did a fine job. I refer particularly to the theme of the article—namely, the real reliance that small intermediate cities place on air service. You can be sure we are highlighting this theme at every opportunity and in every possible place.

LESLIE O. BARNES
President
Allegheny Airlines, Inc.
Washington, D. C.

For Better Understanding

To the Editor:

This is simply a congratulatory note on the graph which appeared on page 15 of the September 13 issue which set out air carrier operating ratios over the 1950-54 period.

This is something which the industry should have made public years ago and I have constantly urged the members of the Airline Finance and Accounting Conference to make the data available to you. The quarterly graph which you propose ought to be of great help in enabling all persons to understand better the problems of the industry.

At some time, you might point out that the margin allowed by an 85% operating ratio is not translated into net profit since taxes and debt service must be paid out of that margin. It would be interesting to know how much of the 15% margin actually is translated into earned surplus or dividend.

With continued appreciation for the understanding which you have of the problems of the air transport industry,

HAROLD L. RUSSELL

Atlanta, Georgia

Stock Gains Understated

To the Editor:

Your August 30 issue summarized a tabulation of the gains in stock prices for 16 leading aircraft companies over the last 15 months. Actually, the figures in this tabulation understated actual stock gains by a considerable margin in several instances through failure to take into account stock splits and stock dividends during the period.

Boeing's actual gain should have been listed as the second greatest in the group, 195%, after adjusting for the company's 2-1 stock split. Douglas also had a 2-1 split and, rather than showing the least gain at 32%, this company really had the third best record at plus 165%. Somewhat higher gains than those listed for Northrop, Lockheed, and Republic would also result if their stock dividends were taken into account.

The range of gains should therefore be from 47% (Beech) to 245% (Northrop—after adjusting for 10% stock dividend). For the group as a whole the gain would be 107% rather than 83%, after making the aforementioned adjustments and after including in the "price now" total one-third of the price for Chance Vought, since United Aircraft stockholders received three Chance Vought shares for each United Aircraft share owned.

On the whole we have found that AMERICAN AVIATION provides very comprehensive coverage of aircraft industry developments, and we would like to congratulate you on the good job you are doing.

JON LOVELACE, JR.
Capital Research Company
Los Angeles, Calif.

A Union's Decision

To the Editor:

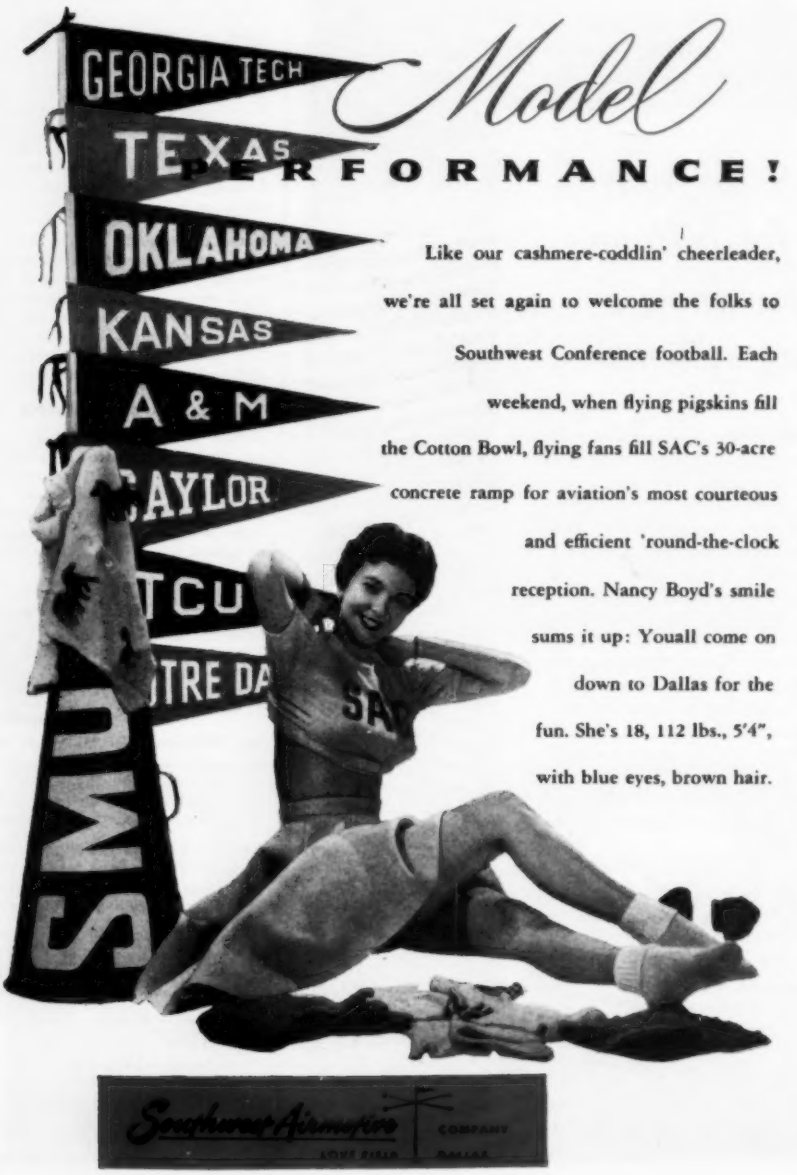
In your August 30th issue, a statement made among the news items makes me burn. This statement of yours reads: "If Republicans lose ground in either the House or Senate, or both. UAW's Walter Reuther and IAM's Al Hayes may decide to take on one of the major plane companies in a strike."

So you think that Mr. Hayes is a dictator and that we who are labor union members are a bunch of sheep?

For your information, the International Association of Machinists is a democratic union in which the rank and file decide whether or not to strike and the vote must be by a two-thirds majority. Mr. Hayes only follows the wishes of the rank and file.

In the future please print accurate information.

H. F. MOORE
Member of Local 1781
Redwood City, Calif.


GEORGIA TECH
TEXAS
OKLAHOMA
KANSAS
A & M
SMU
Model
PERFORMANCE!
Like our cashmere-coddlin' cheerleader, we're all set again to welcome the folks to Southwest Conference football. Each weekend, when flying pigskins fill the Cotton Bowl, flying fans fill SAC's 30-acre concrete ramp for aviation's most courteous and efficient 'round-the-clock reception. Nancy Boyd's smile sums it up: Youall come on down to Dallas for the fun. She's 18, 112 lbs., 5'4", with blue eyes, brown hair.
Southwest Airmotive Company

STRATOS COOLS THE DOUGLAS X-3

MAJOR COMPONENTS X-3 COOLING SYSTEM
BLOWER HEAT EXCHANGER
RAM AIR HEAT EXCHANGER
100 LB/MIN AIR CYCLE REFRIGERATION TURBINE
WATER EVAPORATOR

For cooling the Douglas X-3, Stratos built the highest capacity airborne refrigeration system ever made and designed it to meet the severest requirements yet imposed by high speed flight. It is the first to use an evaporator in conjunction with an air cycle refrigeration turbine to create a compact, reliable system.

Since the X-3 flies for sustained periods at high Mach numbers it will be the first to explore problems arising from the high ambient temperatures which result from ram rise. Refrigeration is, therefore, of critical importance. The Stratos system is required to cool not only the pilot but much of the equipment and many of the compartments in this research airplane.

Stratos is proud to have been called on to design and produce equipment for this radical new research airplane built under the joint sponsorship of the Air Force, the National Advisory Committee for Aeronautics and the Navy.

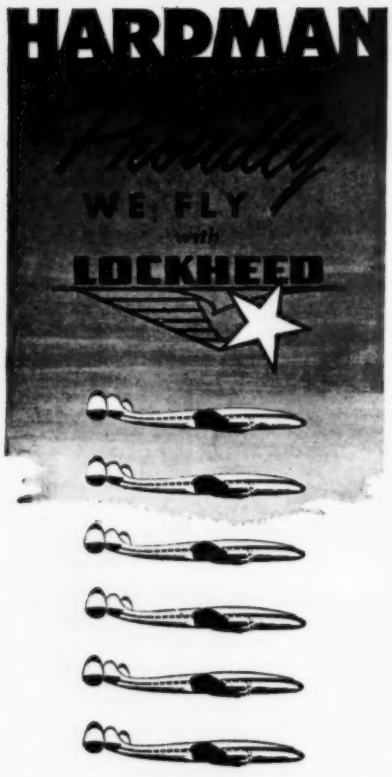
PRINCIPAL STRATOS PRODUCTS: *Jet Bleed Refrigeration Packages • Air Turbine Drives • Pneumatic Controls • Air-Moisture Separators • Cabin Superchargers • Bootstrap Refrigeration Units Mass Flow Valves • Emergency Disconnects*

STRATOS

STRATOS HAS GOOD OPENINGS FOR ENGINEERS • SEND RESUMES

A DIVISION OF FAIRCHILD ENGINE & AIRPLANE CORP.

Main Office: Bay Shore, L. I., N. Y. • West Coast Office: 1355 Westwood Blvd., Los Angeles, Calif.



Flying With Lockheed On:

Air India	QANTAS
AVIANCA	South African
Deutsch Lufthansa	Thai
IBERIA	Trans-Canada
KLM	Transportes Aereos Portugeses
LAV	U. S. Air Force
Northwest Orient	U. S. Navy
Pakistan	VARIG
Panair do Brazil	

HARDMAN SIESTA Seats

HARDMAN TOOL & ENGINEERING CO.
1845 S. Bundy Drive • Los Angeles 25, Calif.

AMERICAN AVIATION

Serving the Industry Since 1937

Editorial Offices: 1025 Vermont Ave., N.W., Washington 5, D.C., USA. Phone: Sterling 3-5400. Cable: AMERAV.

Advertising Offices: LaGuardia Airport, N.Y. Airport Station, Flushing 71, N.Y., USA. Phone: Illinois 7-4100.

WAYNE W. PARRISH, *Editor and Publisher*

WILLIAM D. PERREAULT, *Managing Editor*

Editors:

JOSEPH S. MURPHY, *Engineering*
WILLIAM V. HENZEY, *Transport*
ROBERT M. LOEBELSON, *Manufacturing*
PREBLE STAVER, *Legislative*
WALTER A. KILRAIN, *Technical*
RAYMOND STANN, *Copy & Production*
KEITH SAUNDERS, *News Analysis*
ANTHONY VANDYK, *International*
HARRY S. BAER, JR., *Military*
ERIC BRAMLEY, *Business*
FRED S. HUNTER, *West Coast*
LOIS C. PHILMUS, *Business Aircraft*
WALLACE I. LONGSTRETH, *Rates & Tariffs*
RICHARD SHEARIN, *Dayton*
WILLIAM H. MARTIN, *Art*
FLORENCE JOHNSON, *Airline Statistics*
JEAN-MARIE RICHE, *Paris*
JAMES H. STEVENS, *London*

Correspondents in Major Cities Around the World

●

LEONARD EISERER, *General Manager*
STEPHEN R. KENT, *Director of Advertising*
LARRY BRETTNER, *Circulation Promotion Manager*
GENEVA C. KINNAIRD, *Circulation Service Manager*

REGIONAL OFFICES

New York City: Administration Building, LaGuardia Airport, New York, N. Y. Stephen R. Kent, director of advertising; Menard Doswell III, regional advertising manager. Joan Gay Payne, sales promotion manager. Phone: Illinois 7-4100.

West Coast: Park Central Building, 412 West Sixth St., Los Angeles 14, Calif. Fred S. Hunter, manager; Raymond M. Schuster, regional advertising manager. Phone: Trinity 7997.

Chicago: 139 N. Clark St., Chicago 2, Ill. A. B. Copeland, regional advertising manager. Phone: Central 6-5804.

London: Pearl, Cooper, Ltd., 2-3 Norfolk St., Strand, London, W. C. 2. Phone: Temple Bar 8111.

Paris: Jean-Marie Riche, 11 Rue Condorcet, Paris (9e), France. Phone: TRU 15-39.

PUBLISHING INFORMATION

Published: Every other Monday by American Aviation Publications, Inc., Washington, D.C. Printed at The Telegraph Press, Harrisburg, Pa. Entered as Second Class Matter in Washington and Harrisburg.

Subscription Rates: For U.S. and Canada—$5.00 for 1 year; $8.00 for 2 years. Other countries—$7.00 for 1 year; $12.00 for 2 years.

Incorporates: Airports and Air Carriers; Aviation Equipment; The American Pilot; Aviation Sales & Service; U.S. Aviation; and American Airports. All rights to these names are reserved.

Change of Address: Send old address (exactly as it appears on mailing label on your copy of magazine) and new address, including zone number if any, to American Aviation, 1025 Vermont Ave., N.W., Washington 5, D.C. Allow two weeks for changeover.

PUBLISHING CORPORATION

American Aviation Publications, Inc.: Principal offices at 1025 Vermont Ave., N.W., Washington 5, D.C. Wayne W. Parrish, president; Leonard Eiserer, vice president and general manager; Albert H. Stackpole and Eric Bramley, vice presidents; E. J. Stackpole, Jr., secretary-treasurer.

OTHER PUBLICATIONS AND SERVICES

American Aviation Daily: Daily news service for the entire industry. $200 per year. Managing Editor—Keith Saunders.

American Aviation World-Wide Directory: Twice-yearly listing of products, people, and organizations. $7.50 each. Managing Editor—Marion E. Grambow.

Official Airline Guide: Monthly publication of airline schedules and fares. $13.50 per year in USA; $14.00 in Canada; $15.00 elsewhere. Published from 139 N. Clark St., Chicago 2, Ill. Phone: Central 6-5804. Managing Editor—Robert Parrish.

Air Traffic News (Incorporating Air Traffic Digest): Daily rates and tariff news. $175 per year. Managing Editor—Wallace I. Longstreth.

Airports: Weekly newsletter for airport officials, suppliers, and services. Airmailed every Friday. $25 per year. Managing Editor—Lois C. Philmus.

Air Information Division: 595 Broad Avenue, Ridgefield, N. J. Phone: Morsemere 6-8850. Director—Edward H. Henkler.

ABC AUDITED PAID CIRCULATION · BPA · ABP

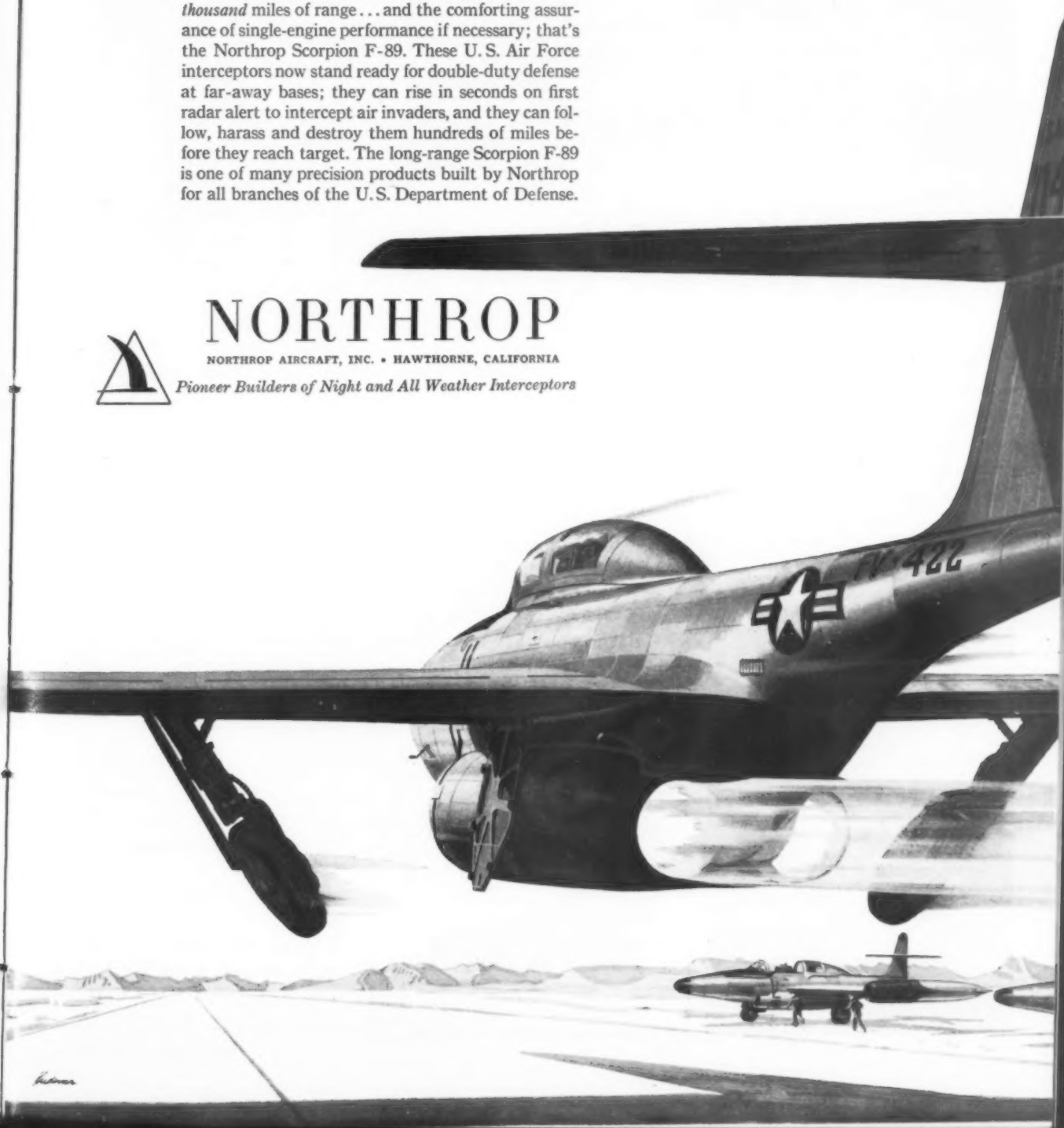
Double Barreled

Two power-packed jet engines, *two* "decks" of 52 rockets, *two* men at controls and triggers, up to *two thousand* miles of range... and the comforting assurance of single-engine performance if necessary; that's the Northrop Scorpion F-89. These U. S. Air Force interceptors now stand ready for double-duty defense at far-away bases; they can rise in seconds on first radar alert to intercept air invaders, and they can follow, harass and destroy them hundreds of miles before they reach target. The long-range Scorpion F-89 is one of many precision products built by Northrop for all branches of the U. S. Department of Defense.

NORTHROP

NORTHROP AIRCRAFT, INC. • HAWTHORNE, CALIFORNIA

Pioneer Builders of Night and All Weather Interceptors



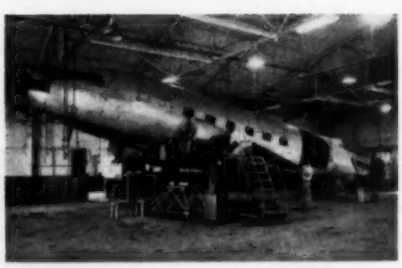
TOP VALUE IN EXECUTIVE AIRCRAFT

DESIGNED TO YOUR SPECIFIC NEEDS

A limited number of airline proved DC-3 aircraft are available at TEMCO for conversion into executive airplanes. These planes, part of a group used in scheduled airline service, were carefully selected for soundness of their basic airframe. They have been disassembled — inspected and tested part by part — and *remanufactured.*

Because of modern improvements, these remanufactured planes are actually better aircraft than they were when new. They will require an absolute minimum of upkeep.

They are now ready for our craftsmen, who have installed appointments for luxury airliners and fabulous presidential planes, to fashion a custom interior to your order.



For details write:

TEMCO AIRCRAFT CORPORATION
DALLAS, TEXAS

Oct. 11, 1954 - Vol. 18 No. 10

IN THIS ISSUE . . .

FEATURE NEWS

Another Round of Piston Engine Transports 19
60,000-foot Ceiling Tops for Manned Bombers 22
Bell's Jet VTO, Unlike the "Bedstead," Can Fly Like an Airplane 23
Tide Has Turned As Airline Subsidy Bill Drops $1 Million 26
Russia Basing Diesels Within Reach of U. S. 29
New Thrust Reverser Developed at WADC 30
Commercial Use Does Speed Helicopter Advances 32
Ed Heinemann . . . Designer by Intuition 34
BuAer Wants All Supporting Equipment Delivered With Its Aircraft 43
Here's A New Business Flying Center 46
Power of the Atom 47
Revamped ANDB—How It Functions 52
Engine Operation and Maintenance 53

DEPARTMENTS

Airtrends 3
News at Deadline 4
Letters 6
Personal View 15
Industry Spotlight 17
When & Where 17
Business 24
News Briefs 25
The Washington View 28
West Coast Talk 38
A Military Commentary 42
People 54
Extra Section 56
Airline Commentary 58
CAB News 60
Maintenance Bulletin Board 62
New Products 64
International Aviation 72
En Route 74
Classified Advertising 76
Industry Aids for the Asking 77
Advertising Index 78

Hertz opens new, finer office in the KANSAS CITY, MO., terminal

Hertz, already at major airports most everywhere, expands again to bring airlines NEW PASSENGER REVENUE.

Why Hertz brings more revenue to your airline

1. Hertz originated the Plane-Auto Plan. Many people who normally drove from city to city—mainly because they needed a car at their destination—now take a plane for speed and comfort . . . because they know they can rent a car from Hertz on arrival.

2. Only Hertz assures your passengers of a car wherever they go . . . because Hertz serves more airports and more cities throughout the world, than any other rent-a-car system.

3. Hertz spends nearly $1,000,000 a year in advertising the Plane-Auto Plan in national magazines. No other rent-a-car company even approaches this figure!

Why your passengers prefer Hertz

1. Because of extensive advertising, Hertz Rent-A-Car has wide acceptance . . . and therefore people demand it.

2. Hertz offers 30 years' experience in courteous rent-a-car service . . . with nearly 800 offices in over 550 cities throughout the world.

3. The 8,600 cars in the Hertz System are clean, new, properly conditioned for dependable driving. The reasonable rate includes all gasoline, oil, Public Liability, Property Damage, Fire and Theft Insurance, and $100.00 deductible collision protection—*at no extra cost!*

4. The Hertz System has issued 1,500,000 Hertz Charge Cards and Courtesy Cards to qualified individuals and firms —and these assure a huge consistent business. Hertz also honors Air Travel Cards.

ONLY Hertz offers all these advantages. Therefore, get your ticket sellers and information clerks to ask your passengers this simple question: **"May I reserve a Hertz car for you at your destination?"** It will pay off in more customer good will . . . and in extra passengers and revenue for your airline.

Promote the Hertz Plane-Auto Plan in all your advertising, displays, folders and other advertising and promotional programs.

For complete information write

HERTZ *Rent-A-Car* **SYSTEM** Department C10, 218 S. Wabash Ave., Chicago 4, Ill., Phone: WEbster 9-5165

BIRDS OF A FEATHER...
The world's best airliners are built in America
MARTIN 4-0-4
LOCKHEED SUPER CONSTELLATION
DOUGLAS DC-7
BOEING STRATOCRUISER
CONVAIR-LINER
No passenger planes out-perform those built in the U.S.A. Measured by accepted standards – dependability, speed, comfort, safety, economy of operation and maintenance – American-made air transports are the backbone of world aviation. Almost every major airline in the world flies one or more types of U.S. passenger planes.
In military aviation, too, America's airliners are serving best. Versions of every modern type are a part of the Military Air Transport Service, ready for any national emergency. When even better passenger planes are built, it will be done in America – where aviation was born. This advertisement is published in the interest of America's aircraft industry and its customer airlines by
CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION

Personal View

By WAYNE W. PARRISH

What Now In Europe?

WORLD EVENTS will move swiftly within the next six months, especially in Europe.

As a result, air power is to get the top defense billing which it should have had all along. The tragedy is that events, not realistic appraisal, are bringing about this air power priority.

With the collapse of the European Defense Community proposal, a collapse foreseen by hard-headed observers from the start, the postwar chapter of U. S. operations in Europe comes to a close. Our air bases will remain, but pulling out of our ground forces with their masses of dependents, is now only a matter of time. And that time is likely to come rapidly.

With a prodigious amount of aid of all kinds from the U. S., Europe has not only recovered economically but the general industrial index is higher than prewar. The recovery of West Germany has been astonishing, if not indeed breathtaking. From now on the U. S. will take a back seat diplomatically regardless of all of the smooth talk coming from conferences. Europe is back at its old stand with all of its traditional nationalisms, its divisions, and its rivalries—all basically unchanged except for the artificialities and alterations of balance created by the last war.

Watch Germany. It is the focal point. The western zone is nearing sovereignty. It is also nearing the go-ahead for rearmament. It won't be long now until West Germany can tell the three western occupying powers to move out—or to retain certain forces "by invitation." Invitation and occupation are two different things.

But will the western powers move out while East Germany remains occupied by Soviet Russia? Here is a crucial point, and a prophecy is perhaps in order.

This writer has visited Berlin a half dozen or so times since the end of World War II. The end to the Berlin four-power puzzle has been one of the world's outstanding riddles, even more so than Germany itself—but four or five years ago this writer came to a conclusion which seemed a bit rash at the time. Nothing that has happened since then has altered those views. The conclusion: *The Russians will be the first to pull out of Germany. When they do, the other three powers will have to pull out, too—posthaste.*

What will remain in Europe is a file full of typical European alliances built on suspicion and self-interest, and carrying no more weight than such agreements ever carry. Britain is now resuming its role of middleman following the collapse of EDC. There will be little except words. Except—and this is a very big exception—the U. S. air bases around the fringe. *U. S. News & World Report,* the keenest and most accurate analyst of world affairs in the U. S., calls this new stage *"peripheral strategy."* By whatever name it may be called, the reliance upon air power is self-evident.

The dominant issue in Europe today is the unification of Germany, not because we or any other powers say so, but simply because the Germans put unification of their own people and country above everything else. The West Germans went to an extreme to go along with the west. France, with all of its petty rivalries and lack of gumption and direction, scuttled the works. Now Germany is free in all but the formalities and her course will be independent. She will again become a big power, perhaps bigger than ever. And she will get her unification, on her terms, not ours.

Another prophecy based on observations and talks on the most recent of this writer's trips abroad—20-odd since the war's end—is in order: *Trade and tourism into the satellite countries may be coming soon.* The Iron Curtain, as it has existed since the war, will tend to disappear. East-west trade, even now flourishing, will expand. But it will be primarily for Europeans. The U. S., despite all of its vast expenditures in Europe, isn't exactly the most popular nation in the world.

Reliance upon ground forces for defense of Europe has been a mere gesture. For the most part our efforts at occupation have been money down the drain, a financial burden to remain on the shoulders of our taxpayers for decades to come.

Offensive air power is the only defense possible in today's world. And Russian strategy, if this writer's observations are correct, calls for easing of tension in Europe. Some will say it is a deceptive easing. Maybe so, but Europe will buy it.

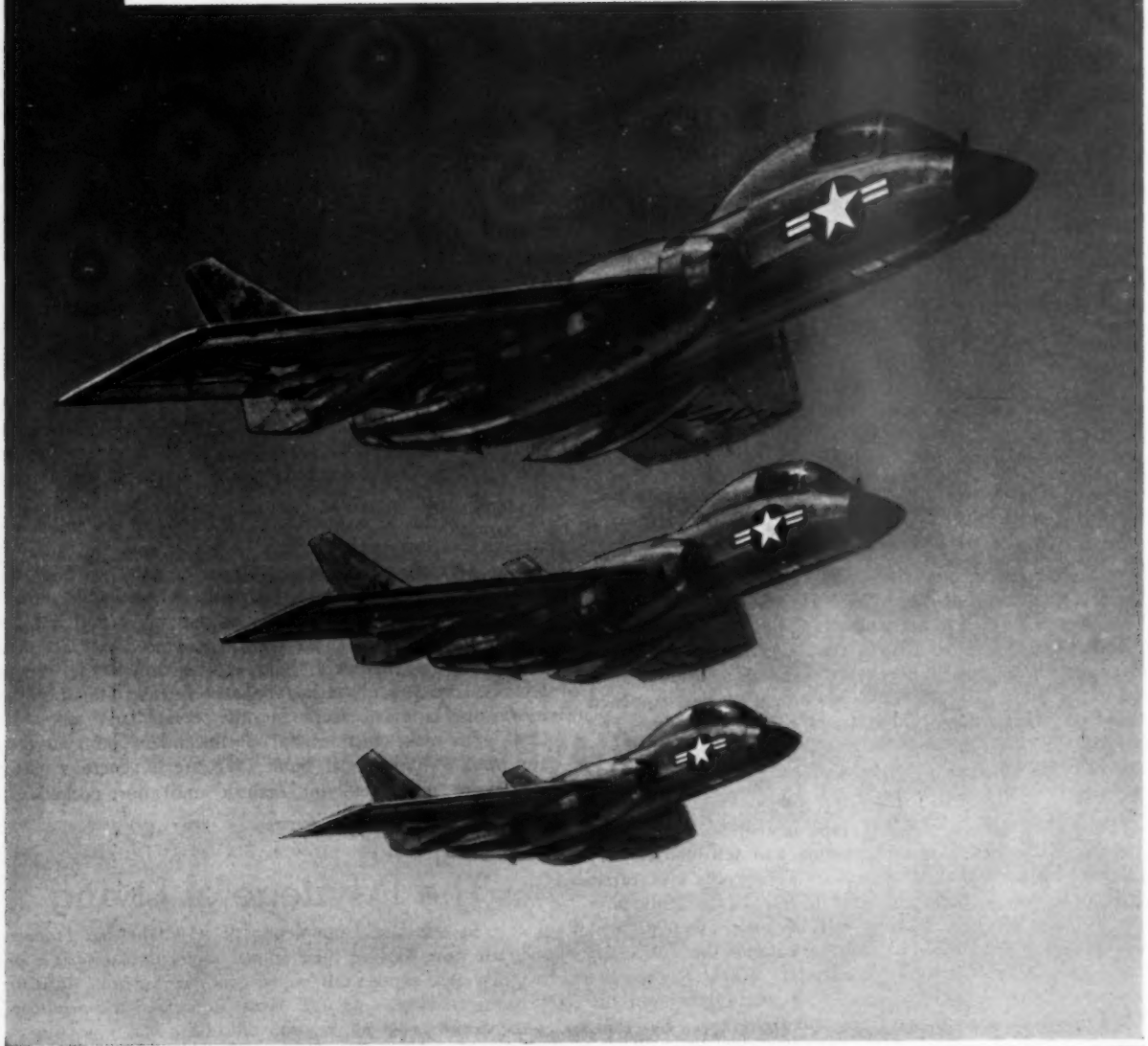
The U. S. is spending an estimated $8 billion in foreign aid this year. It's time this vast sum was cut way down. It's time we did some things for ourselves and stop quibbling over a few paltry thousands at home while throwing billions away abroad. We need federal airport aid, we need strengthened local air services, we need contract pilot training, dual highways, dams for hydro-electric power, schools, and other worthy civil enterprises. Our big day in Europe is over except for air power. Let's stop continuing to make enemies by our misunderstood generosity and resume building at home. We are a generous nation but we're not noted for realism until our pocketbooks are empty.

The Privilege of Living

In the latest newsletter of *The Airmail Pioneers,* who are now holding their annual regional reunions, is one of the finest expressions we've ever come across. It reads: 'Don't resent growing old. Many are denied the privilege." This should be in all aviation offices.

"Triple Threat"

Chance Vought Aircraft's potent F7U-3 Cutlasses, now entering squadron service with the U. S. Navy, are an outstanding example of versatility and striking power in modern carrier-based jet aircraft. Using a wide variety of armament, Cutlasses are designed to fly and fight as interceptors, fighters or attack planes.



Chance Vought Aircraft INCORPORATED

DALLAS, TEXAS

When & Where

Oct. 11-12—AIA national aircraft standards committee, symposium on titanium standard parts, Cleveland.

Oct. 11-15—American Institute of Electrical Engineers fall mtg., Morrison Hotel, Chicago.

Oct. 12-13—ATA annual engineering and maintenance conference, Clift Hotel, San Francisco.

Oct. 13-14—Airport Management and Operation Conference, University of Okla., Norman, Okla.

Oct. 14-15—ATA joint committee on airline sanitation mtg., Georgia Hotel, Atlanta, Ga.

Oct. 17-22—International Union of Aviation Insurers, annual mtg., New York.

Oct. 18-22—National Safety Council, mtg. of aeronautical section, Conrad Hilton Hotel, Chicago.

Oct. 19-20—Seventh annual New York State Airport Development and Operation Conference, Syracuse, N. Y.

Oct. 19-22—ATA purchasing committee mtg., Saxony Hotel, Miami Beach, Fla.

Oct. 23-24—Air Mail Pioneers, Central Div., annual reunion, VFW Club, Elmhurst, Ill.

Oct. 27-29—Southeastern Airport Managers Assn., Cavalier Club, Virginia Beach, Va.

Oct. 27-29—National Business Aircraft Assn. mtg., Hotel Adolphus, Dallas, Tex.

Oct. 28-29—Aircraft Electrical Society, 11th annual display mtg., Pan Pacific Auditorium, Los Angeles.

Nov. 3-4—Transport Aircraft Hydraulic Conference (sponsored by Vickers, Inc.), Park Shelton Hotel, Detroit.

Nov. 4-5—Illuminating Eng. Society, aviation light committee, technical conference, Williamsburg, Va.

Nov. 8-9—National Air Taxi Conference, annual mtg., Biltmore Terrace Hotel, Miami Beach, Fla.

Nov. 8-10—National Aviation Trades Assn. annual convention, Biltmore Terrace Hotel, Miami Beach, Fla.

Nov. 9-12—Air Line Pilots Assn., convention, Sheraton Hotel, Chicago.

Nov. 11-12—Air Mail Pioneers, Western Div., annual reunion, Hollywood Roosevelt Hotel, Los Angeles.

Nov. 12-13—National Symposium on Quality Control and Reliability in Electronics, Statler Hotel, New York City.

Nov. 14-17—Aviation Distributors and Manufacturers Assn., 12th annual mtg., Mayflower Hotel, Washington, D. C.

Nov. 17-19—California Assn. of Airport Executives semi-annual mtg., Claire Hotel, San Jose, Calif.

Nov. 29-Dec. 3—American Society of Mechanical Engineers annual mtg., New York City.

Mar. 28-Apr. 1—Ninth Western Metal Exposition, Pan-Pacific Auditorium, Los Angeles.

INTERNATIONAL

Oct. 14-15—Joint mtg. of Canadian Aeronautical Institute and the Institute of the Aeronautical Sciences, Montreal.

Nov. 8-10—Air Industries and Transport Assn. of Canada, annual mtg., Chateau Frontenac, Quebec City.

Industry Spotlight

• German interest is very high in the licensed production in Germany of the Martin 404 with turboprop engines. Martin has been making design studies on the project for the Germans with various powerplants. Idea is to give Germany a production transport aircraft in 12-18 months time from go-ahead clearance.

• U. S. Air Force is considering a new version of the Martin-built B-57 Canberra bomber. Known as the Courier, the redesigned model is a 6-12 passenger, 500-mph executive transport having a range of about six hours. Prototype Courier, with passenger compartment replacing the bomb bay, has been in Washington for top level USAF demonstrations.

• Douglas Aircraft Company has developed a new engine test stand for ground run-up of the RB-66A photographic reconnaissance airplane. Designed to cut the noise nuisance, the two large Maxim silencers (each larger than the plane's fuselage) are mounted on either side of a pair of fixed tracks. The plane is backed into place between the silencers so that the entire engine pods are enclosed by the silencer units.

• Northrop has developed a simplified fuel system for the F-89 Scorpion which reduces system weight 220 pounds while eliminating 50 component parts and permitting afterburner operation on both engines in either the "all tank" or "wing tank" selector positions. New control console is used with one selector per engine and one emergency crossfeed switch, plus all circuit breakers centrally located.

• Bristol's BE-25 supercharged turboprop engine (AMERICAN AVIATION, *Sept. 27)* is capable of producing 9000 sea-level horsepower although it is torque-limited to 4000 horsepower as part of its design configuration. Torque meters in the reduction gearing restrict fuel flow to limit top horsepower except to meet high temperature or altitude requirements.

• Navy's new Grumman F9F-9, the plane with the "coke bottle" fuselage, has made 14 test flights at Grumman's Peconic River, Long Island, plant and should be ready for Bureau of Aeronautics test evaluation and development trials by early spring. Forty-five F9F-9's, powered by the Wright J65, have been ordered at a cost of $40 million.

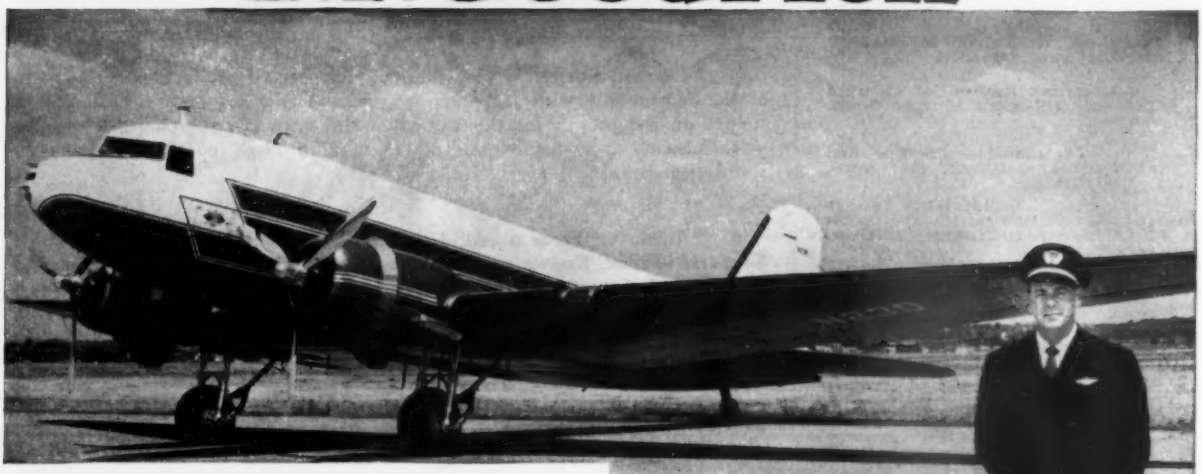
• Indications are that the Navy Bureau of Aeronautics, rather than the USAF, will be the first to contract with Lockheed Aircraft Corp. for the T-33B. Air Force indecision on future trainer requirements plus an ample inventory of current types is reason for delayed USAF action.

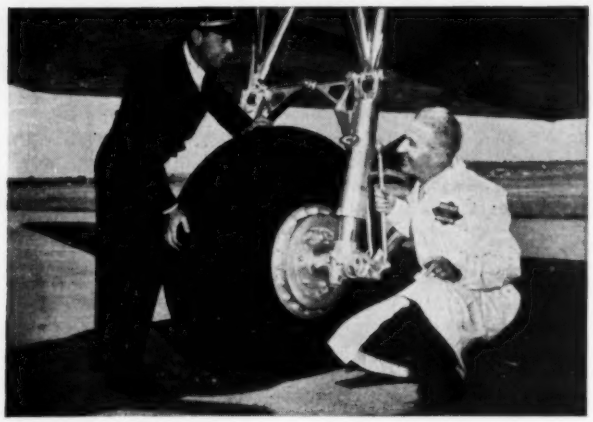
• Official clearance for acceptance of aircraft remains the main stumbling block to delivery of the four Convair 340's, all of which have been completed, to Deutsche Lufthansa. The first of the Lockheed Super Constellations which the German airline is scheduled to receive will probably be for delivery in March.

• Steeper descents will be possible in the Boeing B-47's in the future following development of a new 16-foot-diameter drag parachute by Air Research Development Command. New chute, being installed on current production planes, does not replace the 32-foot diameter chute used to slow the plane on landing.

• National Aeronautical Corp. of Ambler, Pa., has now built 130 civil DME receivers and estimates that 50% of these are already installed in aircraft. Narco obtained an unrestricted type certification of its equipment late last month.

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER





Diamond Alkali's executive plane crew reports:

"Less tire wear, no ice worry, no brake maintenance..."

YOU MAY recognize Chuck Wheeler (right). For 22 years, he was a pilot for a major airline. Yes, he's still flying, but now he's ferrying officials of the Diamond Alkali Company all over the United States.

We caught up with Chuck's DC-3 crew at their home base—Lost Nation Airport, Willoughby, Ohio. Told him we wanted a story on their B. F. Goodrich equipment.

Right off we asked how he liked B. F. Goodrich Dimpled Tires. "They cut and nick less than regular tires," replied Chuck. "A feature we certainly appreciate when landing on rough runways," he continued.

We asked Hank Symanek, the plane's mechanic, about brake maintenance. "No maintenance *at all*," he said. And he estimated that's in 900 landings. Speaking of B. F. Goodrich Expander Tube Brakes, Art Jones, co-pilot (lower left) added, "We chose them because they work smoothly and hold without fading."

Neither pilot ever worries about wing ice. "Our B. F. Goodrich De-Icers never let us down. In winter we can fly above bad weather," they explained. They reported they've had no worries about prop ice either with B. F. Goodrich Anti-Freeze Fluid Feed Shoes. Maintenance? None.

Before we left, Chuck Wheeler mentioned that they were so sold on this B. F. Goodrich equipment that all of them have B. F. Goodrich LIFE-SAVER Tubeless Tires on their cars.

This interview is more proof of what we've been saying right along. That to get the best in safety and dependability, it's a good idea to consult with B. F. Goodrich engineers before you equip your plane. Other B. F. Goodrich products for aviation include: Pressure Sealing Zippers, Avtrim, inflatable seals, fuel cells, Rivnuts, accessories. *The B. F. Goodrich Company, Aeronautical Sales, Akron, Ohio.*

B.F.Goodrich
FIRST IN RUBBER

ESTABLISHED JUNE 1, 1937

World's Largest Aviation Publishers
American Aviation

VOL. 18, NO. 10

NEW "LONG-HAUL" DEVELOPMENTS PROMISE . . .

Another Round of Piston Engine Transports

New compounded engines are announced to power improved aircraft

By Anthony Vandyk

NEW DEVELOPMENTS in the piston field have assured the time-tested reciprocating engine a new lease on life. Simultaneously, early acceptance of turboprop and turbojet engines for commercial transports is bound to suffer.

A completely new phase in long-haul airline operations has been opened by piston engine transport developments in the past few weeks. These developments are highlighted by new competitive moves on the part of Douglas Aircraft Co. and Lockheed Aircraft Corp. to extend the useful lives of their current models and by Curtiss-Wright and Pratt & Whitney to solidify their positions in the piston engine field.

Here's what has happened to dilute the interest of long-haul carriers in turboprop and turbojet transports and promise the industry another round of long-range piston engine transports:

• The new Douglas DC-7C (Seven Seas), long-range transport announced last month with impressive performance specifications, will be even more impressive than originally stated with the availability of a new, more powerful Wright turbo compound engine. The DC-7C—a DC-7 with a new wing which makes possible an unprecedented combination of speed, range, and economy—already made a profound impression with the originally announced powerplant since it will eliminate many present costly and passenger-irritating refueling stops. On the Atlantic, for instance, it will permit non-stop operation in both directions for the first time. With the new engine its performance will be even better.

Drawing of the new DC-7C (Seven Seas) illustrates graphically the 10-foot-wider wing.

• A new wing is being developed for the Super Constellation which will enable the Lockheed transport to match and probably surpass the DC-7C's performance. This wing will also have the same nacelles as those used on the Allison T56-powered Lockheed C-130, thereby facilitating turboprop installation for operators who wish it (the DC-7C apparently is not suitable for modification to turboprop power).

• A new, beefed-up, 3800-hp version of a Wright turbo compound engine, the EA1, will be commercially available to give a higher performance than the DA4, the powerplant originally selected for the DC-7C. This engine will go into the first DC-7C's off the line, those ordered by Pan American World Airways for delivery starting in 1956.

• The 4300-hp compounded version of the Pratt & Whitney R-4360 is being proposed for revival as an alternate powerplant for the Boeing Stratocruiser, Douglas DC-7 series, and Lockheed Super Constellation. A prototype of this engine was built a few years ago and production could be started within a very short time.

The "stretching" of the basic Douglas and Lockheed four-engine transport designs beyond the DC-6B/C and L-749 configurations, respectively, resulted from the availability of the latest Wright turbo compound.

Basically, the EA1 engine is a DA4 with increased power. It is a 4000 hp design—plus product and durability improvements. Nevertheless, it has been "beefed up" all around so that parts for the two models are not interchangeable. An operator with DA4 (or DA1, DA2, or DA3) engines would need an almost complete new set of spares for the EA1.

Although not due to complete its official type certification until next July, the EA1 is not a new engine military-wise: Over 6000 have been built as powerplants for the Lockheed PSV Neptune patrol bomber.

With the same specific fuel consumption of the DA4 (less than .4 lb./bhp/hr. for certain cruise conditions), the EA1, in its present state, develops 3400 hp for take-off, 150 more than the DA3/DA4, with an increase of only 3 inches (58 instead of 55) of manifold pressure.

PAA encouraged Douglas

Priced about $3000-$4000 more than the DA series turbo compounds, the EA1 will be available commercially in late 1955, ready to power the first DC-7C's due to be delivered to Pan American World Airways early in 1956. PAA is the operator whose requirements encouraged Douglas to develop the DC-7C. This represented a major decision for the manufacturer since Douglas four-engine commercial transports, from the DC-4 right through to the DC-7B, have used basically the same 117½-foot wing.

The DC-7C's wingspan is 10 feet greater than the previous design and the fuselage is three feet longer than earlier DC-7 models. Stretching the wing and fuselage has necessitated a two-foot increase in the height of the tail, making it 30 feet 7 inches from the ground.

Apart from increasing the fuel capacity (from 6400 gallons for the DC-6B) to 7860 gallons, the new 127½-foot wing places the engines five feet further from the fuselage, resulting in a marked reduction in cabin noise. Moreover, unlike the DC-7B in which some of the fuel is stored in slipper tanks around the engine nacelles, the entire fuel capacity of the DC-7C is contained in the wing itself.

Although Douglas has not officially announced the effect of the EA1 engine on the DC-7C's performance, company engineers have computed that it permits an increase in take-off weight

DC-7C Performance—with DA4 Engine

Max. Take-off wt.	137,000 lbs.
Max. Landing wt.	107,000 lbs.
Max. Zero Fuel wt.	98,000 lbs.
Fuel Capacity	7,860 U.S. gals.
Power Plant	Wright R3350-DA4
Propeller	Hamilton Standard 34E60-6921C-8 4-bladed (Dia. = 13 ft. 6 in.)

Performance (based on T.S. 1299C)

	Gross Wt. 107,000 lbs.	Gross Wt. 120,000 lbs.
Maximum Level Flight Speed with Rated Power	406 mph	389 mph
Altitude	22,700 ft.	22,500 ft.
Level Flight Speed with Maximum Cruising Power	359 mph	343 mph
Altitude	24,400 ft.	24,100 ft.
Stalling Speed In Landing Configuration at Maximum Landing Weight	99 mph	
Rate of Climb and Ceiling with Rated Power		
4-Engine Maximum R/C at Sea Level	1,687 ft./min.	1,380 ft./min.
4-Engine Maximum R/C at 20,000 ft.	900 ft./min.	667 ft./min
Altitude at which 4-Engine R/C=6V_{so}	23,200 ft.	20,300 ft.
Altitude at which 3-Engine R/C=.04V_{so}^2	19,500 ft.	10,600 ft.
Take-off with T.O. Power		
C.A.A. Field Length at Sea Level	3,180 ft.	4,340 ft.
C.A.A. Field Length at Sea Level—Max. T.O. Weight	6,950 ft.	
Landing		
C.A.A. Field Length at Sea Level	5,400 ft.	

Major Design Features of the EA1 Engine

The EA1 version of the Wright Turbo Compound is more than just a beefed-up DA4. It incorporates several new features as well as redesigned components. The following are some of the EA1's design features:

Nose Section

Strengthened reduction gearing (.4375 ratio) and torquemeter adapter.

Power Section

Crankcase with strengthened diaphragms. Coarse-tooth, four-pinion cam drive and revised cam support. Modified pistons incorporating strengthened and improved design features. Sludge-displacing crankpin plugs.

Cylinder Section

Modified cylinders incorporating thicker flange and other strengthened and improved features. Valves of improved material. Modified inner valve springs and exhaust valve guides, revised intake pipe joint on the front supercharger connection.

Turbine Section

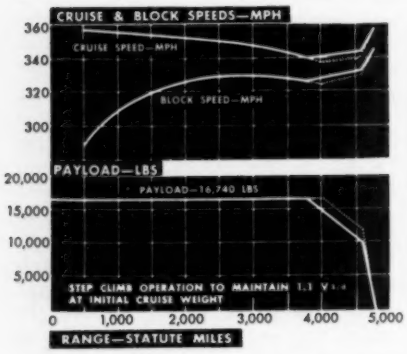
Revised turbine adapter, support, and modified turbine assembly. Revised contour clamps, connector lips, flares, and exhaust pipe brackets.

Rear Section

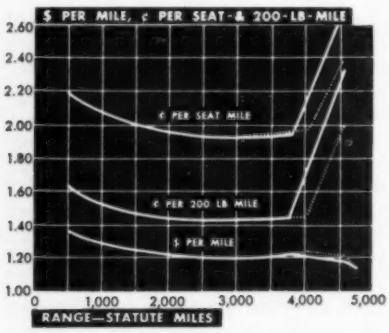
Modified impeller drive assembly. Increased capacity for the pressure oil pump and oil filter unit.

Accessories

Strengthened distributor flanges. 30 deg. advance timing. Flush-mounted fuel injection pumps. CB-type fuel injection nozzles.



SUBSTITUTION of the EA1 for the DA4 engine in the DC-7C enables payload and range to be increased for a slight speed penalty. Dotted line shows the EA1's performance where it differs from that of the DA4 (solid line).



ECONOMIC EFFECT of substituting the EA1 engine for the DA4 in the DC-7C is shown in these charts which are for 1800 bhp power at 23,000 feet. Dotted line shows the EA1's economy where it differs from that of the DA4 (white line).

from 137,000 pounds to 139,000 pounds with an empty weight increase of 360 pounds. At long-range cruise power, the EA1 gives a payload of 12,102 pounds for a range of 5018 miles against the DA4's 10,462 pounds for 5099 miles.

Knowledge of the availability of the EA1 for the DC-7C has heightened several operators' interest in the aircraft. One of the nearest to placing an order is Scandinavian Airlines System, which needs a fast, economical 5000-mile range transport to supplement its DC-6/6B fleet. As the world's largest non-American owner of Douglas four-engine transports, it is strongly attached to the Santa Monica manufacturer.

What about "marriages"

Airlines' "marriages" to certain makes of aircraft and engines play a large part in procurement planning. This is one of the reasons why Pratt & Whitney is reviving the VDT R-4360, developed in the late '40's for bomber use. Several carriers who want to buy DC-7 or Super Constellation aircraft have not done so because they regard themselves as "married" to P&W engines. Hence, availability of a P&W powerplant for these transports would open new markets to both Douglas and Lockheed.

Reports from the west coast indicate, however, that neither Douglas nor Lockheed is enthusiastic about re-engining their products with another piston powerplant. The biggest drawback to the use of the compounded R-4360 in, say, the DC-7C would probably be the very large cooling drag. Furthermore, the P&W engine would add considerable weight to the aircraft. It would very likely give an increase in speed of about 20 mph to the DC-7C.

Lockheed is interested in putting a P&W engine in the Super Constellation, but not the compounded R-4360. It is offering a turboprop version of the Super Connie with the existing wing, using the P&W T34 as powerplant. This aircraft could be available for delivery early in 1957 and Lockheed hopes that it may collect a few domestic orders for it. The main turboprop Super Connie plans, however, center around the Allison T56 in a new wing. Lockheed has discussed this project with airline executives and hopes to have a prototype flying in late 1956.

Nevertheless, both operators and manufacturers realize that the tremendous improvements that have been made in the performance of piston engine transports are making a decision on long-range turboprop aircraft less urgent. In fact, it looks as though piston engine manufacturers will still be selling piston engines for new transports in 1960. • • •

Death of McCarran Big Loss to Aviation

The sudden death of Sen. Pat McCarran on September 28 ended a 22-year career in the Senate, during which time the Nevada Democrat earned the title of "Father of Aviation." He was: (1) Author and sponsor of the Civil Aeronautics Act of 1938, which created the machinery for the CAB and CAA; (2) Sponsor of the first bill in Congress to create a separate Air Force; (3) Author and sponsor of the Federal Airport Act; and (4) Co-author of the Civilian Pilot Training Act. His influence in Congress is expected to still be felt when the 84th Congress convenes in January since his omnibus aviation bill (S.2647) is scheduled to be reintroduced. The bill is a rewrite and updating of the Civil Aeronautics Act.

Tributes paid by aviation officials in telegrams to McCarran's family in part are as follows:

Five members of the CAB: "Aviation has lost one of its greatest all-time friends; *CAA Administrator F. B. Lee:* ". . . your grief is shared by those of us in aviation who have worked with Senator McCarran over the years. He was a fine and brilliant man and he will long be remembered by the many who admired and respected him." *ATA President Earl Johnson:* "The air transport industry regards the death of Senator McCarran as a grievous loss to civil aviation. He deserves the gratitude of the country for his contributions during his 22 years in the Senate to the development of the world's leading air transport system which today, in the words of the basic civil aviation law which he fathered, is indispensable to our country's commerce, postal service and national defense."

AIA Asks Protection For Prime Contractors

Possibility that the Army and Navy Bureau of Ordnance might put industry-developed guided missiles into production at government arsenals and at other plants without full compensation to the prime contractor has led the Aircraft Industries Association to ask the Defense Department to revise Section 9 of the Armed Services Procurement Regulation.

In essence, what AIA and aircraft firms are seeking as a tri-service directive is an extension of the "Air Force Policy on Establishment of Supplementary Sources of Aircraft Production" which went into effect in December 1952. The USAF policy statement acknowledges that certain "proprietary rights will be given appropriate recognition" when second sources of production are set up.

THIS de HAVILLAND HERON four-engine executive transport has been delivered to Washington where it will be used by the British Ambassador and the British Joint Services Mission. It is the first Heron to see service in this country.

Norlin Will Aid SAS After Resignation

Per A. Norlin, who late last month announced his resignation as president of Scandinavian Airlines System effective January 1, is expected to remain closely associated with SAS, the three-nation carrier which he helped create and develop. It has become known that he will be on the SAS inaugural flight from Copenhagen to Los Angeles in mid-November.

Norlin

Throne-Holst

The SAS presidency will be assumed on January 1 by a well-known Swedish industrialist, Henning Throne-Holst, who has a reputation for being a tough and effective troubleshooter. Throne-Holst heads Scandia-Vabis, a leading manufacturer of automotive equipment and, since last year, has been a member of the SAS board of directors.

It is expected that Throne-Holst will introduce many changes to the SAS organization. Norlin said that he decided to resign "because of conditions under which the president is forced to work, notably the limited authority delegated to him." The background to his decision was a national and personal fight for power in which he never participated. The general feeling in Sweden, as reflected in press comments, is that Norlin's position had become untenable and under the circumstances the best thing for him to do was to step down.

Ramo-Wooldridge Opens Big Missile Project

A major new missile project has been launched by the Ramo-Wooldridge Corp. of Los Angeles, which simultaneously hired three leading missile scientists.

The firm's research and development work on missiles will involve the spending of $9 million during the coming year, including construction of a laboratory and office building, according to Dr. Dean E. Wooldridge, president. The firm, which is an affiliate of Thompson Products, was formed when Wooldridge and Dr. Simon Ramo left Hughes Aircraft Co. last year.

The three scientists hired are:

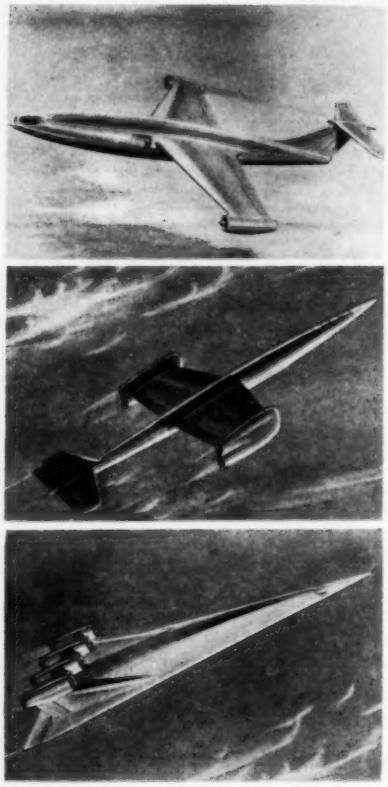
Dr. Louis G. Dunn, former director of Cal Tech's jet propulsion laboratory, recently head of the development program of the Army's Corporal surface-to-surface missile. He will be associate director of the R-W missile research division.

Dr. Milton U. Clauser, formerly with Douglas, recently head of Purdue's School of Aeronautics. He will direct the aeronautics and structures staff in missile research.

Dr. James C. Fletcher, formerly head of theory and analysis for the air-to-air Falcon missile at Hughes Aircraft. He will direct the guidance and control staff.

60,000-foot Ceiling Tops for Manned Bombers, Says British Expert

The ceiling for manned bombers is 60,000 feet, according to David Keith-Lucas, chief designer for Short Bros. and Harland Ltd. Speaking before a British engineering group, he gave a line on current British thinking on bombers. Keith-Lucas pointed out that while a jet-powered craft would have difficulty in reaching 60,000 feet, a rocket-driven vehicle would not (at that



Keith-Lucas used these drawings to illustrate his points on bomber design. Above, a low-altitude bomber; center, a straight-winged supersonic bomber; bottom, a delta-wing.

height, turbojet power is 12½% of sea level static thrust whereas rocket power delivers 122% thrust).

Keith-Lucas said that a bomber can cruise at a true air speed of 500 knots at 60,000 feet, but, with the aircraft tightly clamped between buffet boundary and stall, with the indicated air speed at 155 mph, there would be no margin for maneuver. The only way of assuring maneuverability would be through low wing-loading, with delta or crescent planform to meet aeroelastic distortion, he asserted.

The low-altitude bomber of the future will fly at less than radar or missile altitude and 200 to 300 lbs.-per-sq.-ft. wing loadings will be necessary, Keith-Lucas declared. Since wing drag will have to be kept down, parasite take-off or flight refueling will be used to achieve range, he prophesied. In all events the trip would be rough and navigation difficult, he indicated.

Pilotless bombers with half fuel, no crew, and no pressurization would be much smaller, lighter, and easier to design, Keith-Lucas said, pointing out, however, that navigation and penetration are problems. If the navigation difficulties could be solved, he predicted the disappearance of the manned bomber.

Present-day thinking points to a step-type rocket to achieve uninterceptable approach and long range, the British designer indicated. Such rockets would fly at 180 miles altitude and have a range of 3000 miles. Guidance, he said, is very difficult in thin air. The German V-2 rocket 60 miles up had a true air speed of 2400 mph and an indicated air speed of 2½ mph, he pointed out.

CAB Weighs Objections To FTL-Slick Plan

The future of the nation's two largest all-cargo carriers—Flying Tigers and Slick Airways—continued to hinge on CAB's handling of the lines' merger-abandonment agreement at press-time.

Subsequent to filing of the agreement, under which FTL would quit the cargo field, labor unions (notably FTL pilots), Air Line Pilots Association, and the International Association of Machinists, filed protests with CAB urging denial or full-scale hearings.

Main basis of the charges against the carriers' proposal is that it is an attempt to effect a consolidation without being forced to pay employee protective benefits. The carriers deny this, pointing out that FTL would be strictly a leasing company in the future—aside from possible contract operations—and its routes would be abandoned.

Managements of the two lines have indicated informally that failure of CAB to approve the new agreement would force the withdrawal of both companies from the cargo business.

The proposal, which CAB has been asked to approve this month, involves: (1) Cancellation of the merger agreement between the carriers; (2) Withdrawal by FTL of its application for renewal of its cargo certificates; and (3) Continued operation by Slick in the cargo field under a stepped-up program.

A highlight of Slick's future plans, if CAB approves, is the contemplated association with Slick of former top government official Delos W. Rentzel.

Contrary to early reports that indicated Rentzel would become Slick's president, Rentzel told AMERICAN AVIATION he would help Slick in various ways but would not become president. Rentzel currently is engaged successfully as president of Auto Transports, Inc. and Texas Auto Transports, Inc., of Oklahoma City.

He said he has no intentions of severing his connection with the trucking firm. However, he indicated that if Slick can get untangled from its present situation and gets a green light from CAB, he would willingly assist the line in its cargo business.

The Tiger pilots, meanwhile, asserted the decision to abandon the merger was induced by an agreement under which Slick pilots would accept a 25% reduction in pay. Tiger pilots are ALPA members; Slick pilots are not.

It was also charged by the FTL pilots that various FTL stockholders had filed suit in the U. S. District Court, Southern District of California, to enjoin management from proceeding under the agreement.

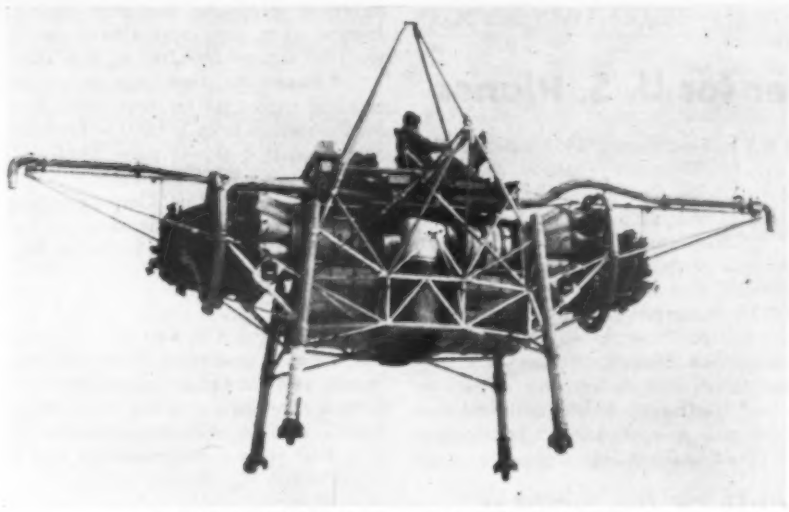
Wilson Urges Speed-Up In Republic Deliveries

Republic Aviation following a visit to Farmingdale by Defense Secretary Wilson, Air Secretary Talbott, and other officials, last week started studying ways to clear its airfield of undelivered F-84F's and resume its original production schedule.

Wilson told Mundy I. Peale, Republic president, that the AF and NATO badly need the swept-wing Thunderstreaks, and urged him to get Wright J65 engines into the planes so they could be flown to nearby centers for other modifications.

The bottleneck started developing several months ago because of a shortage of engines. That shortage has now been cleared up, but most of the planes at Farmingdale are still awaiting installation of the J65 and other fixes.

In the interim, Republic laid off about 7000 of its 29,000 workers and cut its production schedule to prevent further clogging of the airfield. Now, as a result of Wilson's visit, Republic will probably let an outside organization handle modifications at nearby fields after the planes are made flyable by the installation of engines, and will go back to the former schedule. There is little likelihood, however, that many of those laid off will be rehired.



FLYING BEDSTEAD: Note the 90° angle of jet exhaust.

Bell's Jet VTO, Unlike the "Bedstead" Can Fly Like an Airplane

Details of the two new vertical take-off vehicles—a Bell aircraft and the Rolls-Royce "Flying Bedstead" have been revealed. Bell Aircraft Corp. has carried out several test flights with its privately financed model (company designation: VTOL—vertical take-off and landing). It uses two 1000-lb.-thrust Fairchild J44's mounted near the center of gravity, one on either side of the fuselage.

Closely resembling a normal aircraft, the VTOL takes off vertically by rotating the J44's 90 deg. to deflect thrust downward. After it rises, the engines are rotated to the horizontal position for normal flight. To land, the plane is slowed down and the jets are tilted upright. Air jet reaction is used for directional, longitudinal, and lateral control, a turbine providing air to the wingtips and tail.

Both the Bell and the Rolls-Royce craft are essentially flying test beds. The British "Flying Bedstead" is powered by two Nenes set horizontally in opposition, one at either end of the framework. The jets from these engines are carried through 90 deg., so that both engines discharge vertically downward under the center of gravity. The control moments are supplied by compressed air jets which are discharged through nozzles at the end of crossarms. The air for these nozzles is bled from both engines, and the pilot, using a conventional control column and rudder bar, regulates the flow through the nozzles. The "Flying Bedstead" has been flown free to heights up to 25 ft.

Bell's announcement came on the heels of the British releases citing the relatively advanced state of their VTO work compared to that going in the U. S. Virtually all official comment on the Rolls-Royce project included reference to its "obvious advantages" over the Convair and Lockheed VTO planes, in which "the pilot sits on his neck during take-off."

There are undoubtedly advantages to both approaches, however. The Bell development might be said to have obvious advantages over the Rolls-Royce unit. It is an airplane. It is not only directionally controllable, as is the R-R unit, but it can be flown as a conventional aircraft.

This advantage grows out of the ability to rotate the engines and produce forward thrust in a conventional manner. In the British unit the engine arrangement makes high forward thrust unlikely since only a small proportion of total thrust can be put through the limited control ducts.

Rolls-Royce, on the other hand, has produced a much more powerful prototype which necessarily brings with it complications which must be faced if a practical aircraft of military interest is to evolve.

CAB Mail Rate Proposal Averages 41c/Ton-Mile

CAB has proposed a new multi-element service mail rate structure for the 13 domestic trunk airlines which could mean a net $3.2 million cut in annual service payments. Generally considered a compromise between the 48¢ per-ton-mile average rate sought by most airlines and a 25¢ rate proposed by the Post Office, CAB's dual-rate would produce an industry average of 41.46¢ per ton-mile.

The carriers and Post Office were given until October 11 to file notices of objections to CAB's show-cause proposal.

The new structure involves a so-called "line-haul" rate of 30.10¢ per ton-mile, which will apply uniformly for all carriers. To this will be added a terminal charge per pound which varies according to the class of terminal (or station) involved.

For five of the 13 carriers—Eastern, National, Braniff, Capital, and Delta—the new structure would mean slightly more service mail pay annually. The estimated increase would range from a low of $2000 annually for National to a high of $193,000 for Capital.

But for the other eight, reductions would result. Sharpest hit would be United which would get $1,385,000 less annually. TWA would be cut $1,051,000 and American $877,000.

For the six carriers now being paid 45¢ per ton-mile, following is what CAB estimates their average rate will be under the new structure: American, 39.78¢; Eastern, 47.29¢; TWA, 37.03¢; United, 38.04¢; National, 45.06¢; and Northwest, 39.15¢.

For other carriers, results will be: Braniff, increased from 52.66¢ to 56.19¢; Capital, increased from 46.80¢ to 55.54¢; Delta, reduced from 51¢ to 50.31¢; Western, reduced from 50¢ to 49.19¢; Colonial, reduced from 75¢ to 67.84¢; Continental, reduced from 75¢ to 55.56¢; and Northwest, increased from 75¢ to 90.91¢.

New annual total bill for the Post Office to pay would be $29,517,000, according to CAB estimates, as compared to $32,753,000, if the present structure were continued.

$250 Million In Reserve For Plant Readiness

The Office of Defense Mobilization's program to keep the nation's aircraft and other defense plants in a state of readiness for M-day will be financed out of the $250 million available in the Office of the Secretary of Defense for "Reserve Tools and Facilities."

Stemming from a recommendation by a group headed by Harold S. Vance, board chairman of Studebaker Corp., the $250 million will also be used to buy special machine tools and equipment. Most of the money, however, will be allocated by ODM's new Defense Facilities Maintenance Board to keep war plants ready for production. Outright purchase of such plants is planned if that proves necessary.

Holland Best Customer for U. S. Planes

SIZE of the market abroad for American civil aircraft has been highlighted by the Aircraft Industries Associated in *Planes:* From 1947 to 1953 the U.S. exported 6430 civil aircraft and 2893 civil engines. Dollar value of the exports during the seven years came to $293.6 million. Total for the industry in both military and civil exports during the period was $2.53 billion.

Best customer out of the 103 countries involved was Holland, which spent $55.7 million on civil aircraft, followed by France, which spent $43.8 million.

Transports led the sales list in dollar value, 418 having been sold for $247.8 million to 48 countries. Next came 5701 utility planes, worth $28.9 million to 89 countries. Forty-four countries bought 311 helicopters for $12.4 million.

During 1954 through August, 361 civil aircraft of 6000 pounds and under were sold abroad for $5.2 million.

Elsewhere:

• **Eastern Air Lines** doubled its dividend rate, raising it to one dollar a year per share. First of the new dividends, which will be distributed quarterly, will be paid on December 13 to stock of record November 16.

• **Rohr Aircraft Corp.** ended a record fiscal year on July 31 with net earnings of $3.59 million (up from $1.53 million.) Sales reached $101.6 million (up from $63.3 million). Backlog on July 31: $130 million. At the same time came word that Rohr's one million shares of common stock ($1 par) had been approved for listing on the Los Angeles Stock Exchange. Nine hundred thousand shares are now outstanding.

• **British Overseas Airways Corp.** reports a net profit of $2.98 million for its fiscal year ended March 31. The firm is still in the black, despite the Comet grounding, according to its chairman, Sir Miles Thomas.

• **The Garrett Corp.** reports that its earnings for the year ended June 30 dropped to $2.85 million, down from the preceding year's $3.08 million, despite an increase in sales from $96.3 million to $101.2 million. Record investment in research and development was cited as part of the reason for the decline in profits.

• **Capital Airlines** operating revenues for the month of August topped $5 million. For the eight months of 1954 through August, operating revenues reached $31.5 million (up from $30.3 million during 1953's comparable period). Increased expenses, however, drove down net income: $843,000 instead of over $1 million.

• **Northeast Airlines** reports an August profit (before income tax) of $265,000 (up from $243,366 in August, 1953). Passengers carried increased 21% to 80,926. Nevertheless NEA, citing rising costs, announced plans for a 10% fare increase as of Nov. 1.

• **Northwest Airlines** finished August with an operating net before taxes of $1.68 million, up from last year's figure of $1.01 for the same month. Income after taxes was almost double the 1953 figure: $808,000 vs. $447,000.

• **Stanley Aviation Corp.** reports net earnings tripled for the year ended June 30. Profits rose from $55,000 to $169,000. Sales rose at a slower pace: $3.66 million, up from $2.44 million.

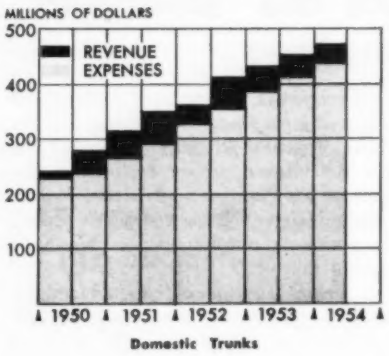
• **Temco Aircraft Corp.** will pay a 15c-a-share quarterly dividend on October 15 to stockholders of record September 24.

Contracts

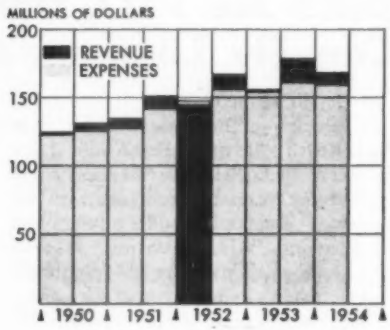
• **Standard Oil Co.** of California has signed a contract for over $50 million in gasoline and allied products with **United Air Lines,** covering the needs of UAL's western route segments for the next four years. The contract is said to

PULSE OF THE INDUSTRY

Airline Revenue and Expense—1950-1954



Domestic Trunks



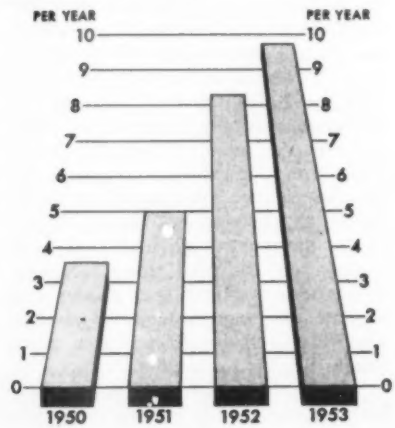
U. S. International Airlines

For each of the six-month periods shown in the bar charts above, revenues and expenses of the domestic trunk airlines have climbed continuously to reach new highs in the first half of 1954. However, since the second half of 1952, the difference between the two gets narrower as increased costs pushed up expenses and a tremendous expansion of coach traffic diluted revenues.

U. S. international airlines also encountered a problem starting in 1952, in that traffic is markedly superior in the second half of each year when compared to the first half. Historically, winter months have been bad for airlines, but with off-season fares, tourist services, and this year, "go now—pay later" travel plans the airlines hoped to have balanced year round traffic.

Aircraft Industry—Annual Rate of Capital Turnover

On the manufacturing side of the picture, the aircraft industry in recent years is turning over its capital at a greatly accelerated rate under the impetus of military spending. Net sales reached nearly 10 times total net worth in 1953. Percentage of profits to net sales, however, stayed relatively low when compared to the rest of the manufacturing industry, being 4.5%, 2.2%, 2.4%, and 2.4%, respectively, for the years shown in the graph. In addition to an expensive product, the rate of turnover reflects government ownership, in 1953, of nearly two-thirds of total inventory.



represent a 100% increase over UAL's purchases from Standard Oil for 1952-1954. It accounts for about 45% of United's petroleum purchases.

• **Menasco Manufacturing Co.** has received an order to build the nose gear for Boeing's 717 jet tanker.

Facilities

• **North American Aviation** has received clearance to build a $1.5 million general headquarters adjacent to the Los Angeles International Airport, following a vote by the city council of El Segundo, Calif., to rezone the site.

• **Thompson Aircraft Tire Corp.** has begun construction of new general offices in San Francisco, where it will occupy 3000 square feet.

• **Hughes Aircraft Co.** has taken a one-year lease on a hangar for storage purposes at Tucson Municipal Airport.

• **Continental Aviation & Engineering Corp.** has moved into its two new buildings totalling 50,000 square feet at 12700 Kercheval Ave., Detroit 15, Mich.

• **Stratoflex, Inc.,** of Fort Worth, opened a factory branch in Los Angeles early this month, at 9430 Bellanca Ave.

• **Aircraft Armaments Inc.** was scheduled to move into its new plant in Cockeysville (suburban Baltimore), Md. early this month. Armament development and manufacturing work is located in the new plant, which is due to double in size by next summer, in order to accommodate electronic and electro-mechanical departments. The firm is a subsidiary of Hayes Manufacturing Co., Grand Rapids.

General

• **Nuclear Development Associates, Inc.,** White Plains, N. Y., has sold a minority interest to Laurance S. and David Rockefeller. The 75-scientist firm lists nuclear reactors among its major projects, which include work for the Defense Department, the Atomic Energy Commission, and United Aircraft Corp.

• **Federal Parachute Co.** has been set up as a division of Fashion Frocks, Inc., of Cincinnati, Ohio, which manufactured parachutes during World War II and the Korean War. Production will be in Hamilton, Ohio.

• **Litton Industries,** Beverly Hills, Calif., has purchased West Coast Electronics Co., Los Angeles, communications and electronics manufacturer. The latter will continue under its own name as a Litton subsidiary. Litton also bought the assets of Digital Control Systems, Inc., of La Jolla, Calif.

• **Bell Aircraft Corp.** has received a 65% rapid tax write-off on $661,718 from the Office of Defense Mobilization. Research and production of aircraft parts is involved.

PROCUREMENT NOTES

October 20 has been set as the date for a meeting in New York for about 170 large eastern prime USAF contractors to discuss the complaints of subcontractors about contract cancelations. It is similar to the meeting held in Chicago on September 28 for midwest USAF prime contractors. Meeting place: Engineers Club.

The new renegotiation law passed during the closing days of the last Congress contains an amendment raising the exemption to $500,000 of annual business. This is good news to a large number of subcontractors whose major complaint of the old law was the excessive amount of bookkeeping.

USAF statisticians state that the Air Force now has 1,250,000 supply items in inventory in their depots. In comparison, the two largest mail order houses have a combined inventory of under 200,000 items.

To instill "cost consciousness" in the operating officials, MATS will be given the fiscal treatment known as "industrial funding" by the new USAF Comptroller, Assistant Secretary Lyle S. Garlock. As assistant to Defense Comptroller Wilfred J. McNeil, Mr. Garlock was influential in the funding of MSTS (Military Sea Transport Service). This fiscal plan included working capital funds, a dollar inventory, and cost accounting system used by private business. After a two-year trial it resulted in a saving of $196 million or 27% in operating costs.

The Air Force has computed that during the past fiscal year $1.6 billion or 28.7% of the total aviation "hardware" contracts went to small business, i.e. firms with under 500 employees. One-third of this amount was in the form of prime contracts.

Except for a few overseas bases, the Monetary Inventory Accounting system, i.e. dollar value for inventory, is completely installed in the Air Force. It is part of an intergrated accrual system of accounting that will reflect all assets, liabilities, income, and expenses. Many base commanders are learning for the first time the value of their stations and something about their operating expenses. This new financial responsibility is expected to result in considerable savings.

News Briefs

Uncertainties in the future of the Comet have led the South African Department of Transport to suggest that South African Airways boost its order for Douglas DC-7B's from three to seven. The SAA Constellations would then be switched to domestic routes.

The first of six Boeing Stratocruisers which United Air Lines sold to BOAC has been delivered to Lockheed Aircraft Service-International for modification to tourist configuration. Remainder will be delivered by January 5.

Italy has decorated Warren Lee Pierson, TWA board chairman, for his contributions to the rebirth of Italian aviation. Prime Minister Mario Scelba decorated Pierson as a Grand Officer of the Order of the Republic.

Honors also came to Pan American-Grace Airways president Andrew B. Shea, who was awarded Chile's Order of Merit, grade of Great Commander, for his work in developing Panagra, which has served Chile for 25 years.

First "passenger" flight for Boeing's jet 707 transport/tanker took it from Seattle to Portland, Ore., in 13 minutes, an average speed of over 636 mph. Top company officials were aboard.

Convair has delivered the first three of 33 C-131D cargo planes to the Military Air Transport Service. Some of the "D's," which are standard Convair 340's, will be used as executive transports.

First North American F-100 combat wing will be the 479th Day Fighter Wing at George AFB, Calif. Delivery begins soon.

Elected as directors of National Airlines are Dan R. Topping, head of the New York Yankees, and Edwin C. McDonald, vice president of the Metropolitan Life Insurance Co.

Coordinating the modernization program of the Spanish civil airways, which is being conducted jointly by the Foreign Operations Administration and the CAA, is Richard Elwell. Elwell, formerly CAA general counsel, has been named special advisor to the CAA administrator for the purpose.

Selig Altschul, New York aviation consultant, will assist the Hoover Commission in its study of the Military Air Transport Service. Recommendations on the forthcoming MATS reorganization will result from the Hoover study.

Design of a proposed terminal building at Miami International Airport is being objected to by National Airlines. NAL has filed suit to restrain further work on the project, charging that Eastern Air Lines and Pan American have been given choice locations while NAL has been "struck behind the door," although National is the second largest user of the field.

Tide Has Turned as Airline Subsidy Bill Drops $1 Million

Reduction for overseas carriers totals $2.8 million to offset other rises

By William V. Henzey

THE TOTAL AIRLINE subsidy bill for all U.S. carriers will show a $1 million net reduction this year according to CAB's newest estimates. But the favorable trend is somewhat offset by the fact that three of the four classifications of air carriers show slightly increased subsidy needs.

Aside from the nine domestic trunks who require no subsidy, the best picture is presented by the international and overseas carriers whose total subsidy requirements for fiscal 1955 will be down $2.8 million from the 1954 figure.

Domestically, the trunkline subsidy bill will be up $1 million largely due to Braniff Airways' return to the subsidy class. Local service need will be up about $800,000 and helicopter need up about $35,000.

The total subsidy bill, however, will be $79,426,000 for fiscal 1955, as compared to $80,448,000 for the previous year. Significantly, the new CAB estimate is also under that of a year ago in which the Board anticipated fiscal 1955 requirements to be $80,252,000.

As indicated by CAB Rates Division Chief Irving Roth before a Congressional Appropriation Committee this year, the tide has turned on the mounting subsidy bill. In addition to the overall drop estimated for the current fiscal year, the Board feels a further drop will occur in fiscal 1956 when the total should decline to $79,100,000.

Steady increase in mail pay

Meanwhile, the Board estimates a steady increase in service payments to the carriers for the actual mail service rendered the PO. But the agency's studies reflect less optimism for such increases domestically than those of a year ago.

For example, last year it was expected that trunkline service pay would reach $36.3 million in fiscal 1955. This year, the CAB estimate is $34.7 million, although the agency predicts the $36 million figure will now be reached in fiscal 1956.

Overall, however, the Post Office should pay the airlines a total of $59,793,000 for carrying the mail for the current fiscal year. That is $2.8 million more than a year ago, a gain bolstered largely by an estimated $1.4 million increase in the international field.

In fiscal 1956, CAB anticipates total service pay will climb to $62,093,000, with the afore-mentioned expected gain in the domestic trunk field largely responsible.

The new figures are the fourth in an annual series put out by CAB each September 30. This year though, there's a difference. Previously, the studies were deemed "administrative" and generally were considered for information only. This year, however, with subsidy and service payments separated by Presidential order, the study is no longer labeled "administrative" and actually reflects best estimates of how much each carrier and class of carriers will get in subsidy and service payments.

Surface-mail-by-air

Also an innovation this year, is the inclusion of payment to those domestic carriers engaged in surface-mail-by-air experiments.

For fiscal 1955, CAB estimates the seven trunks participating in those experiments will receive $1,767,000 in service pay for carrying 3¢ letter mail. The local service industry, CAB expects, will realize $43,000 from their part in the experiments.

American Airlines, with $478,000 in surface mail revenues is the biggest beneficiary among the airlines in that category. United is next with $360,000, TWA third with $322,000, and Capital fourth with $276,000.

The biggest story, however, is the general improvement in the international field. Comparing fiscal 1955 with fiscal 1954, Pan American will show a $500,000 drop in Trans-Atlantic subsidies and TWA a $300,000 drop.

In Latin America, a more favorable subsidy picture is created by Braniff whose subsidy will drop $400,000. Pan Am, Delta, and Panagra show slight increases in that area.

Most significant reduction, however, is estimated to take place in the Pacific area where Pan Am subsidy will drop $1.3 million and Northwest will show a $500,000 cut. Previously, the trans-Pacific area ranked second to Latin America as the highest international subsidy area. Now, CAB estimates trans-Pacific will require less than both the Latin America and trans-Atlantic regions.

Locals' needs taper off

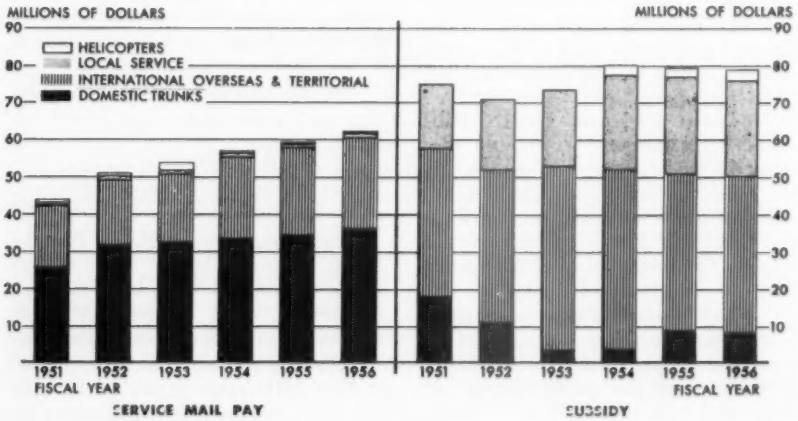
In other areas, CAB estimates slight reductions for fiscal 1955 in Hawaii and intra-Alaska and a slight increase in the States-Alaska territory.

The local service carriers' needs, meanwhile, despite slightly higher requirements for fiscal 1955 and 1956, actually appear to have tapered off from the generally alarming $3.5 million hike that took place in fiscal 1954.

This year's requirements are $700,000 more than 1954's, and next year's will be up only $100,000, CAB estimates, despite continued expansion of local services throughout the country.

It should be pointed out, however, to pay these amounts to the carriers the CAB must get the necessary appropriations from Congress. In the last go-around, Congress appropriated slightly more than half of CAB's request. The money so appropriated will run out early next year and the key to future Congressional policy on airline subsidies may be developed on Congressional reaction to CAB's request for a supplemental appropriation to pay the airline for a full fiscal year. • • •

Here are the trends . . .



Right from the START !

Engine Thrust depends on fuel controls! Since the beginnings of the jet age, CECO jet engine fuel controls have helped to propel America's most advanced aircraft . . . **up faster . . . out farther** . . . in the race for world air supremacy. Today, more than 27,000 controls later, they're still proving their superiority . . . still aiding the free world's finest jets — like the F-86H Sabre — to achieve new performance records.

Ask our engineering-production teams to turn your plans into practical realities. They have done so for others!

CECO

CHANDLER-EVANS

DIVISION NILES-BEMENT-POND COMPANY

WEST HARTFORD 1, CONN., U.S.A.

PIONEER PRODUCERS OF

FUEL CONTROLS • AFTERBURNER CONTROLS • PUMPS

SERVOMECHANISMS • CARBURETORS • PROTEK-PLUGS

The Washington View

How Valid Is Foreign Aid Criticism?

Foreign Aid Director Harold Stassen is toying with the idea of making a full-scale rebuttal to the Senate Appropriations Committee staff-written report which criticizes use of U. S. foreign aid funds to build up the British aircraft industry.

A final decision has not been reached as to whether the matter should be dropped, in the hope it will blow over, or whether it would be better to vigorously refute and disprove the allegations.

Stassen previously took issue with the Senate report generally, branding it as "most inaccurate," but there has never been a detailed FOA reply. The immediate response, apparently, was without a first-hand knowledge of the situation and its antecedents.

Recently, however, a 25-page technical analysis answering the charges was prepared by the London office of FOA and forwarded to Washington. Although it is unclassified, copies have been unobtainable.

Perhaps the best gauge for determining the validity of the Senate report's charges will be found in the willingness of FOA to reveal the London office report.

Counsel for the Locals

The Conference of Local Service Airlines today is not only looking for a successor to Donald W. Nyrop as counsel and Washington representative, but is also making a searching re-appraisal of the objectives on which it was created less than 18 months ago.

In February 1953, when Nyrop went with the group, he was to undertake one or two specific and pressing problems. His No. 1 project was to be equipment—how to finance and obtain construction of a suitable DC-3 replacement. And there was also the responsibility of working on certificate renewal problems and mail rates.

However, at the end of 18 months all these details had been subordinated to the one big issue— survival. Congressional liaison work on Capital Hill became the most important activity and it almost reached a successful conclusion.

The question being asked is: Has the $25,000-a-year counsel post for the local airlines become primarily a legislative responsibility with the economic and operational details of a secondary nature?

Caught in the Middle

Ever since the Air Force went into the business of leasing aircraft to commercial operators after World War II there has been vacillation in deciding whether or not to sell the planes to the lessees.

This indecision partly explains, perhaps, why the rental fleet has shrunk from a one-time high of 106 C-46 aircraft and 38 C-54's, which originally flooded the market, to its current status of less than 60 C-46's and a couple of C-54's.

For the past six months the AF is known to have been preparing terms for the sale of the remaining C-46's. Now, it has abruptly announced that there is no immediate plan to sell any of the AF planes.

What is the small operator with one or two AF planes to do now? The C-46 is under a CAB order requiring extensive modifications, and the operators are reluctant to make such expenditures on leased equipment. The Air Force says the lessees will have to stand the expense of modifications if they want to keep the planes in service.

The Air Force led the operators into thinking the aircraft would be sold to them so they did not make definite alternative plans for the future.

Now the operators are caught in the middle.

That Eight-Hour Rule

CAB is devoting special attention to a permanent ruling on the controversial eight-hour flight rule to replace the temporary waiver of the rule granted earlier. A Board action in this direction could be the answer to the American Airlines-Air Lines Pilots Association dispute.

The reason that a CAB action might be binding is that no decision is expected in the arbitration proceeding, which is being refereed by David L. Cole, between American and its pilots.

The real accomplishment in going to arbitration after the 25-day pilot strike in August was that it got the pilots back to work and American back in operation. However, both sides immediately agreed that the arbitrator's decision would not be binding.

Therefore, it is reasonable to expect that neither side would accept a positive ruling from Cole. In the face of a positive ruling, no matter which way, the only outcome would be to resume the strike. Thus it seems the arbitration proceedings may deliberately drag on until the Board acts.

. . . Preble Staver

Russia Basing Diesels Within Reach of U. S.

- **Report says bombers may have surveyed possible targets**
- **New bases in east reflect Soviet interest in jet stream**

SOVIET reconnaissance aircraft are capable of flying over Alaska and even reaching San Francisco, and some intelligence reports suggest that they may have already done so.

New information on how these spy planes are able to carry out their long-range missions has come from AMERICAN AVIATION sources in contact with developments inside the Soviet Union.

The Red Air Force's long-range reconnaissance units are independent components within the strategic air command. They have the prime mission of surveying possible targets on the North American continent destined for ultimate attack by the command's bombers.

The long-range reconnaissance units are equipped with specially modified versions of two bomber types. The newer of the two is the Miassishchev Mi-13RD and the older is the Tupolev Tu-4, basically a copy of the Boeing B-29. At the moment there are five long-range squadrons each with 10 aircraft (including two tankers).

The unusual feature of both these reconnaissance planes is that they are powered by diesel engines. Developed at the Moscow-Khimki engine center, these are not original engines, but modifications of the German Jumo 223 and 224 units. Thus, the Red Air Force is the only air arm in the world to make use of the diesel as Germany's Luftwaffe did.

9000-mile range

The diesel powerplant gives the Soviet reconnaissance planes an extremely long range. Sources estimate that the Tu-4 can fly 8000 miles and the Mi-13RD almost 9000 miles. Such ranges would not apply to bomber versions of the diesel-powered planes since the reconnaissance aircraft are lightly armed and carry no bombs. The Mi-13RD cruises at between 310 and 350 mph and can stay in the air for 24 hours. The Tu-4's endurance is less

The diesel engines for the Red Air Force's planes are manufactured in Komsomolsk in the Far East. Production has been under way for over a year and a half but, because of lack of skilled workers and other difficulties, the plant has been able to build only enough replacement engines for five of the 10 reconnaissance squadrons. Certain major components for the Mi-13RD and Tu-4 are also made in the Soviet Far East—at Komsomolsk and Khabarovsk.

Both training and operational reconnaissance units are based on Sakhalin island while their headquarters are located on the mainland west of Komsomolsk on the Amur. A local command post is at Anadyr. A second headquarters, for units on the Arctic Ocean, is being set up either at Archangel or at Amderma. All available information indicates that there is only one squadron presently based near the Arctic Ocean. The remainder are in areas close to Alaska—on Sakhalin island, on the Kamchatka peninsula, and near Anadyr.

Bases on Sakhalin

The great interest recently shown by the Red Air Force in developing bases on Shakhalin island (eight have been built there) seems to have been a sudden awareness of the utility of the jet stream. This strong wind stream blows over the Pacific Ocean from the northern part of the Japanese island of Honshu somewhere between 38 and 42 degrees N. latitude and at altitudes of 25,000 to 40,000 feet directly to the U. S. west coast.

The jet stream is used by commercial aircraft flying from Japan to the U. S. and gives them a speed boost of over 150 mph at times. To reach this stream the Soviet reconnaissance planes would have to fly about 900 miles southeast of their bases on Sakhalin island. Then they could ride the jet stream all the way to San Francisco.

Intelligence men have estimated that even the old piston-engine Tu-4, by using jet stream, could reach its target on the American coast. Its return flight would be difficult since it would have to buck headwinds on its flight up the coast to Alaska, over Alaska, and across the Bering Straits. Nevertheless, it could do this if it refueled at one of the bases on the Gulf of Anadyr. With the economy of the diesel, the flight would certainly be no problem.

Thus it seems clear that the build-up on Sakhalin island was predicted on the use of the jet stream for reconnaissance missions to the U. S. The bases on this island include the following: Okha (9200-foot runway where a Mi-13RD squadron is based; Moskal'vo, which is connected to Okha by a pipeline and is the base of a Tu-4 reconnaissance squadron; and Aleksandrovsk, a field which is at the disposal of the long-range reconnaissance arm of the strategic air command but which may also be used as a civil airport. There are seaplane bases as well as airfields at both Okha and Moskal'vo.

Refuel in flight

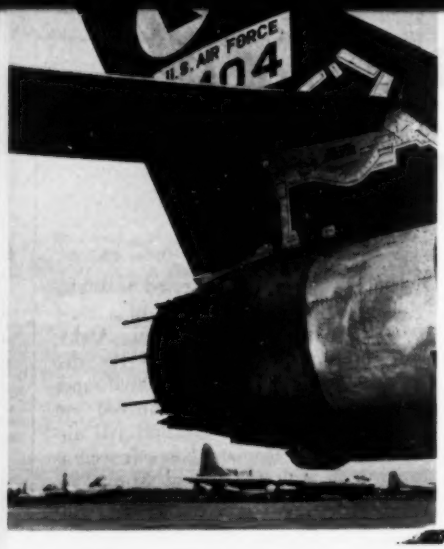
The third long-range reconnaissance squadron is located at Petropavlosk on Katchatka peninsula. The fourth squadron, with Mi-13RD's, is at one of the many bases near Anadyr, not far from the Bering Straits which separate Alaska from Russia. The fifth squadron, also with Mi-13RD's, will be based on one of the Novosibirski Islands.

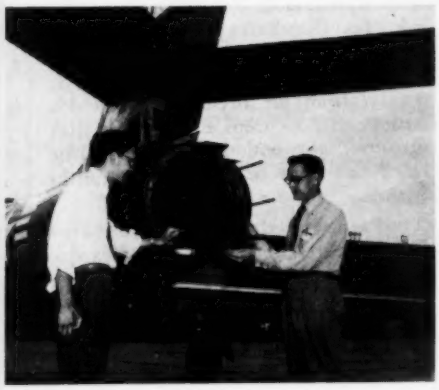
To extend the range of the Tu-4 and Mi-13RD, the Russians are experimenting with various flight refueling systems, including one similar to that developed in England by Flight Refuelling Ltd., and now widely adopted by the USAF. Tanker aircraft are specially modified versions of the Tu-4 and Tu-70. They are also assigned to bomber units of the strategic air command and to La-17 and MiG-19 escort fighter units. In one of the Russian systems the probe of the receiver aircraft is located in the leading edge of the left wing and is extended from or retracted into the wing as required.

En-route refueling is also available for Soviet flying-boats which are being developed for reconnaissance use. Using German and Japanese experience in building submarine tankers, the Russians have a mobile fuel storage system at their disposal. Some of these submarine tankers are probably based at Medni in the northern Komondorskis, about 320 miles northeast of Petropavlovsk. Moreover, flying-boat tankers are being developed for use in conjunction with the Red Navy's submarine tankers.

Flying-boat development

Although little has been reported on Soviet flying-boat development work, it is known that in 1953 Tupolev and his associate, Y. A. Kosolev, built a four-engine model which is believed to be equipped with diesel engines for





The WADC thrust reverser, shown in photos above, is mounted on F-84F test aircraft. General similarity to Aerojet-Snecma at right can be seen. Shown in lower photo are Charles M. Donaldson (left), project engineer, and Robert P. Nordli, assistant section chief of engine installations branch, Power Plant Laboratory, at WADC.

New Thrust Reverser Developed at WADC

THE U. S. Air Force has developed and test flown a new jet thrust reverser for use in cutting down the landing roll and for possible in-flight applications as a tactical device. The new unit, designed and fabricated at Wright Air Development Center, has been tested on a Republic F-84F.

Lockheed Aircraft Corp. has recently been granted a contract for a "general study of reverse thrust" (AMERICAN AVIATION, *Sept. 27*) and two other contracts with industry for comparable developments are scheduled for completion early this month.

The WADC thrust reverser *(see photos)* generally resembles France's SNECMA-produced unit which is licensed to Aerojet-General Corp. for U. S. development and production. Basically it consists of a series of ring-like deflectors mounted at the tail end of the jet engine and normally clear of exhaust gas flow. Two movable "flippers" are used to divert exhaust gas flow into the cascade rings which deflect the air forward.

By contrast, the Aerojet unit uses a jet of air to divert gas flow into the cascades to effect reversal.

The USAF does not indicate its future plans for the WADC-developed thrust reverser. It simply states that the unit "was devised as an experimental system to determine its characteristics and effectiveness."

FORWARD THRUST
EXHAUST JET FOLLOWS NORMAL PATH UNAFFECTED BY REVERSER
REVERSED THRUST
EXHAUST JET IS DEFLECTED AND REVERSED

Above is a cutaway of the Aerojet-Snecma thrust reverser installed on a jet engine tailpipe. Front side shows retracted position when the reverser is not in use. Opposite side is extended to show how exhaust is deflected by obstructing flap and concave rings, producing reverse thrust. When not in use, this thrust reverser causes no thrust loss. It will not necessarily result in increased aircraft weight because its use can eliminate dive brakes.

long-range reconnaissance work. A more recent Tupolev-designed water-based aircraft is believed to have four jet engines and to feature a swept-back wing. A prototype of the latter model was tested on the Amur River between Komsomolsk and Khabarovsk and used a tail parachute to shorten its alighting run.

Important spy aid

Although the picture is far from complete, it seems clear that the Soviet Union is amassing a powerful reconnaissance force of landplanes and flying-boats which, by the use of the jet stream, high-efficiency low-consumption diesel powerplants, and en-route refueling techniques, represents an important aid to the Russian spy system for North America. • • •

Defense Plane Spending To Level at $10 Billion

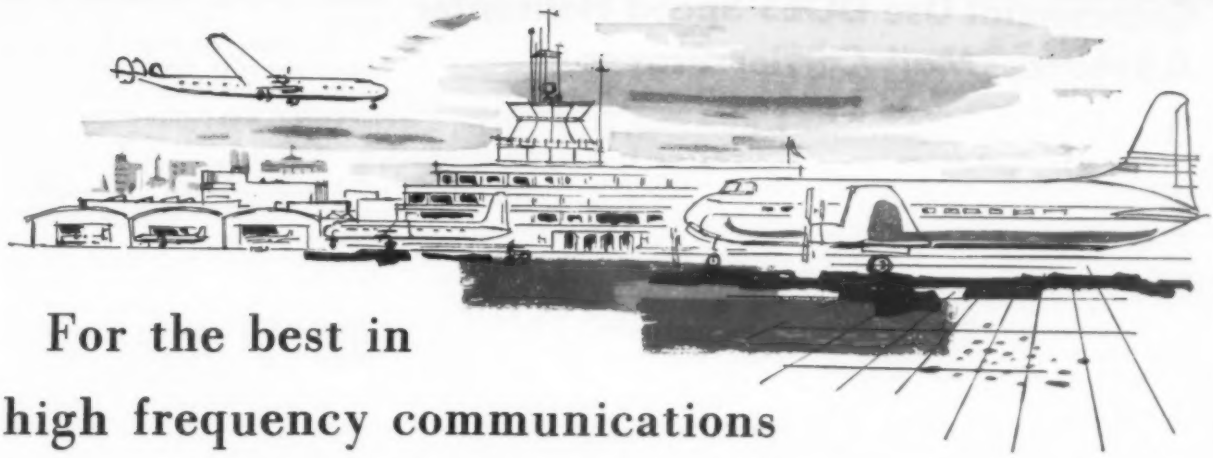
After June 30, 1957, when the Navy and Air Force have attained their present aircraft expansion goals, the subsequent level-off calls for an aircraft production rate of between 7700 and 7900 planes a year worth more than $10 billion, according to present Defense Department thinking.

These figures present a sharp upturn over earlier estimates. Data presented before the House Military Appropriations Subcommittee during hearings last spring on the fiscal 1955 budget had indicated that once the goals were reached, industry could expect to produce 6000-6500 planes a year with sales totaling $7 billion.

Meanwhile, the Defense Department, which entered fiscal 1955 with a total of $9,224,508,000 in unobligated money for aircraft procurement, placed orders for $201,079,000 during July, first month of fiscal year 1955. An additional $18,844,000 worth of aircraft was ordered for MDAP nations.

In July, the Navy's net obligation figure for aircraft was greater than that of the Air Force. The Navy figure was $101,911,000; the AF's, $99,176,000.

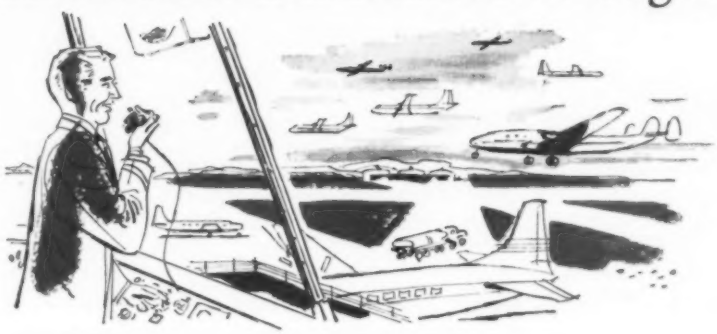
Obligation of fiscal year 1955 money may be hampered somewhat as a result of an amendment to Public Law 663 inserted by Rep. John Taber (R.-N.Y.). According to a Pentagon fiscal expert, the amendment may result in a very low level of obligations this fiscal year and may make justification of new money requested in the fiscal 1956 budget for the armed services more difficult.



For the best in high frequency communications

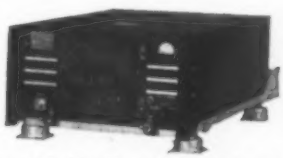
COLLINS

618S Transceiver with the 180-L automatic antenna tuning unit

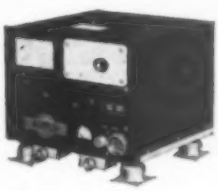


FOR MANY YEARS the Collins designed AN/ART-13 was *the* outstanding HF Transmitter in aviation — commercial and military, domestic and international.
After the ART-13 came the Collins 18S HF Transmitter-Receiver. In incorporating the same quality features and advanced design detail as the ART-13, the 18S series has served the industry well and has been accepted universally by the commercial and military operators.
Now the 618S Transceiver, featuring 144 channels, 100 watts, modular construction incorporating mechanical filters and crystal saving circuits is taking its place in the Collins line of HF equipment.
Already purchased and in service by many of the great airlines of the world, this transceiver has now been accepted by the Air Force and is being acquired for use in their global operations.
The 618S with the 180-L is proving again Collins leadership in the HF field.

Collins 618S 144 Channel HF Transceiver for all purpose air-borne communications.



Collins 18S 20 Channel HF Transceiver.



Collins 180L-2 Automatic Antenna Tuning Unit for use with 618S or 18S. Makes all antenna adjustments automatically.

Collins 614D Frequency Control Unit for use with the 618S Transceiver.

Shockmounts

350S-1 Shock feet for air-borne or mobile installations.
350S-2 No shock feet. Designed for shock mounted shelf.

COLLINS RADIO COMPANY CEDAR RAPIDS, IOWA

261 Madison Ave., NEW YORK 16
1930 Hi-Line Drive, DALLAS 2
2700 W. Olive Ave., BURBANK
Collins Radio Company of Canada, Ltd., 74 Sparks St., OTTAWA, ONT.

COLLINS

Commercial Use DOES Speed Helicopter Advances, Mail Carrier Proves

ARGUMENTS in favor of loaning military helicopters to commercial operators to speed the accumulation of operating experience are bolstered by the results of liaison maintained between Helicopter Air Service of Chicago and Aircooled Motors, Inc. of Syracuse, N.Y.

A series of design improvements in the 200-horsepower Franklin engine were conceived, developed, and put into production for military and commercial users based on experience accumulated by the scheduled mail carrier. These improvements were made much sooner than would have been possible if the engine had been used by the military alone, according to the engine manufacturer.

Since the spring of 1950, the helicopter carrier has totaled over 25,000 hours on 10 Franklin 6V4-200-C32 engines which power its fleet of seven Bell 47D's. During that time Aircooled Motors has performed 82 top or major overhauls. Top overhauls are done at intervals of 360 hours and major overhauls at 720 hours.

Among the design changes that Aircooled has made as a result of HAS recommendations are:

• **Exhaust valve erosion:** Excessive erosion was detected on HAS exhaust valves after only 300 to 600 hours of operation. As a result, a new valve was designed, laboratory tested, service tested on HAS flights, and placed in production. By the time the first complaint was received from the military the new valve was fully available. Time saved for the military: a year and a half.

• **Piston and piston ring wear:** A severe problem of wear in the piston, piston ring, and cylinder liner showed up following HAS operational use of the engine. Pistons were accordingly redesigned with a cast iron insert at the top piston-ring location. After service tests on HAS engines, the results of the change were determined—a 300% improvement. A chrome-plated piston ring was also installed at the top compression ring location. Result—100% improvement in piston-ring and cylinder-liner life.

• **Bearing rotation:** Examination of HAS engines revealed that at certain temperatures the main bearings were rotating in the crankcase as a result of insufficient crush between crankcase and bearing shells. The length of the bearings was consequently increased 0.0005 inches and the bore of the crankcase was decreased 0.0005 inches. These changes raised the temperature at which rotation would take place above the normal operating temperatures of the engine.

• **Cylinder cracking:** A crack at exhaust port of an HAS cylinder proved to have resulted from a reduction in thickness in that portion of the casting. A slight shift in the core of the casting was found to be responsible. A casting modification eliminated the possibility of serious trouble for the military and other operators.

In addition to such design changes, HAS has service tested new parts introduced by Aircooled and provided the company with information on service problems and operating procedures.

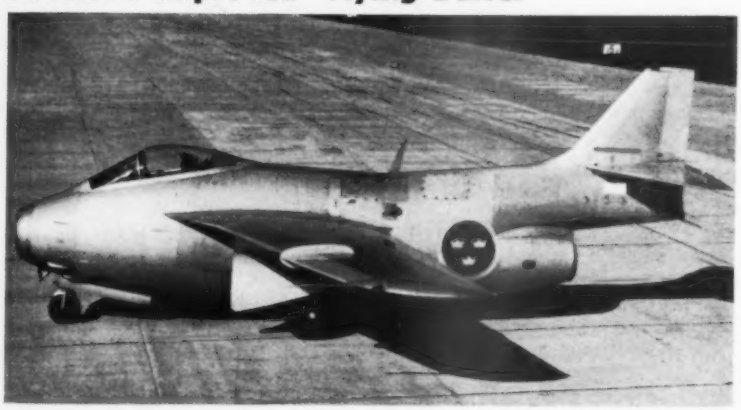
"The cooperation of Helicopter Air Service in submitting such data," says Aircooled's service engineering manager, William Marble, "has assisted us in making operating recommendations to the military services and other operators."

An attack on what is described by HAS as the weakest link in present helicopter engines—exhaust valves—is currently being conducted for Aircooled. Sodium-cooled valves and a series of other design modifications are incorporated in an experimental engine, two more of which are on test by the Army. Over 200 hours of operational time have so far been accumulated, with extremely satisfactory service reported. After approximately 350 hours the engine will be torn down, then reassembled, and run for another 350 hours.

Within six to eight months the engine will have about 700 hours on it. In the same period of time the two military test engines will have accumulated only 100 to 200 hours.

• • •

Sweden's Improved "Flying Barrel"



Sweden is modernizing a number of its Saab-29 (J29) "flying barrel" fighters by adding an afterburner to the DH Ghost powerplant and modifying the outer wing. The first production modified aircraft, designated J29F has flown, and the new version is due to enter squadron service later this year. The afterburner was designed by the Royal Swedish Air Board and developed in cooperation with Svenska Flygmotor AB, license builder of the Ghost.

SOUTHERN CALIFORNIA
Aviation
HEADQUARTERS

★ AVIATION ROOM
Home of the "Q.B's"
★ AIRLINES CENTER
American, Pan-American, TWA, and Western ticket offices.
★ AIRPORTRANSIT
Exclusive Hollywood Stop
★ AIRCRAFT MFG. CENTER

The "Islander"
Cinegrill ★ Garden Grill
Heated Swimming Pool

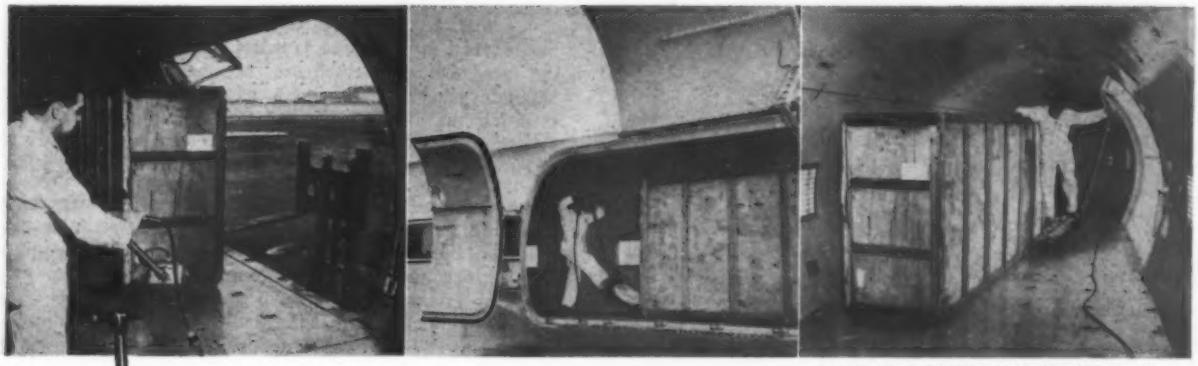
Hull Hotels
Hollywood ROOSEVELT Hotel

7000 HOLLYWOOD BLVD. HOLLYWOOD 28, CALIF.
• PHONE HO 9-2442 • TELETYPE LA 547
THOS. E. HULL, PRESIDENT L. B. NELSON, GENERAL MANAGER

• Slash cargo handling time!
• Reduce manpower!
• Cut time on ground!

with sensational new

WESTERN GEAR TUG-BAR



PHOTOS COURTESY OF DOUGLAS AIRCRAFT CO., INC.

When cargo must be handled in cramped quarters and bulky freight moved efficiently and quickly, that's where Tug-Bar excels! One man with a Tug-Bar can move two tons, put it where it's needed without fuss or cuss. Tug-Bar is the ideal answer for fast, efficient one-man freight handling, whether for aircraft, railroad, truck or trailer use. Tug-Bar is flexible, easy to control, operates wherever there is room for a man to stand. Low floor loading with optional load lips available for any loading requirement. Weighs only 110 lbs., available in standard units, 110V AC or 24V DC.

Tug-Bar is manufactured by Western Gear Works, known since 1888 as one of the nation's foremost designers and manufacturers of gears and mechanical equipment for the transmission of motion and torque.

For further details on Tug-Bar and its operation write L. A. Myhre, Executive Offices, Western Gear Works, P.O. Box 182, Lynwood, Calif.

5445

Thos. J. Bannan, President

Since 1888

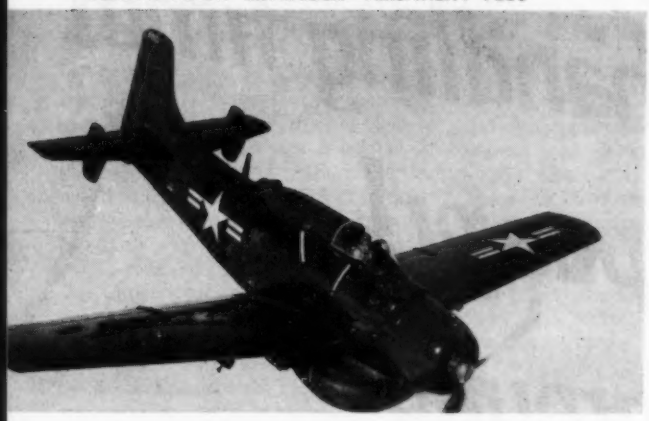
WESTERN GEAR WORKS

PACIFIC-WESTERN PRODUCTS | POWER TRANSMISSION GEARS • MACHINERY

PACIFIC GEAR & TOOL WORKS · SOUTH WESTERN GEAR WORKS

PLANTS AT LYNWOOD, PASADENA, BELMONT, SAN FRANCISCO (CALIF.)
SEATTLE AND HOUSTON — REPRESENTATIVES IN PRINCIPAL CITIES

BELOW: AD-3W SKYRAIDER—VERSATILITY PLUS



F3D SKYKNIGHT—FIRST NAVY FIGHTER BY DOUGLAS

A3D—ATTACK PLANE CARRIES CREW OF THREE

F4D SKYRAY—COMPONENTS BY DOUGLAS, TOO

ED HEINEMANN . . .

But for Douglas and the Navy he runs one of the most productive plants in the country at El Segundo

THE VICE PRESIDENT of a rival aircraft company was only half jesting when he observed:

"Next to the DC-3, best thing that ever happened to the Douglas Aircraft Co. was Ed Heinemann."

The DC-3 put Douglas in the forefront in the air transport market. Heinemann has kept Douglas in the forefront in the military market with his new designs for the armed forces.

Current backlog of the four divisions of the Douglas company is approximately $2 billion. The El Segundo division, of which Edward H. Heinemann is chief engineer, accounts for $1.1 billion—more than half of the total amount.

The El Segundo division's growth has been as phenomenal in plant area as it has been in revenues. In 1935, the year before Heinemann became chief engineer, El Segundo had 128,288 square feet of covered area. Now, counting the 185,000-square-foot A4D building under construction, the division spreads out over 4,236,075 square feet of covered area—33 times more space than it had in 1935.

Arthur E. Raymond, vice president in charge of engineering for Douglas, describes Heinemann as an intuitive designer. He has other talents. He is a practical engineer, a good organizer, a capable administrator, and an extraordinary salesman of his own wares. And he has a fine flair for publicity (the Heinemann clippings pile almost as high as the Heinemann blue prints). He also knows how to get out the work.

In the last 10 years, his engineering staff at El Segundo has designed 11 different airplanes which met military approval. That's undoubtedly a record for one engineering staff in one plant. More than likely it's a record unmatched by any one company regardless of the number of plants or divisions. Here's Heinemann's record:

TB2D	F4D-1
AD-1, -2, -3, -4, -5, -6	F4D-2
D-558-1	A2D
D-558-2	A3D
F3D-1, -2	A4D
F3D-3	

Good illustration of Heinemann's design intuition is the AD series which, because of the large numbers produced, might be called the DC-3 of El Segundo—except that the DC-3 remained pretty true to form throughout its manufacturing career whereas Heinemann's engineers have done about everything you can think of to the AD. The AD-5 and AD-6 in production today are a far cry from the first AD-1 of 1945, which is why the series still is in production for the Navy after 10 years.

Another example is the more recent A3D. Heinemann's conception of what a twin-jet bomber should be in this A-bomb age was so good that the Air Force bought it, too. The Air Force version is the RB/B-66, now in

designer by intuition

COVER STORY BY FRED S. HUNTER

production at Douglas Long Beach.

Heinemann, a 6-foot 2-inch stringbean type who has a good enough appetite but never seems to put on a pound, is a restless man. He can't sit down and see a thing undone. He has a resolute streak, too. Whenever someone says *you can't do it,* Heinemann inevitably wants to know why he can't—and usually proceeds to find a way to do it.

This does not mean he's infallible. He makes mistakes, too. The SB2D was one. Heinemann hatched this turkey for the Navy late in World War II. It came out 2000 pounds overweight. Then the government-furnished equipment came in 2500 pounds overweight. Added up, the total was much too much. The government canceled the airplane.

Ever since, Heinemann has been the industry's implacable—and outspoken—foe of excess weight. Anytime a spare pound gets into an El Segundo plane it will be over Heinemann's prostrate form.

Actually, the SB2D cancelation was a blessing in disguise. Along with Leo Devlin, now assistant chief engineer at Douglas El Segundo, and Gene Root, now head of engineering research and development for Lockheed, Heinemann was in Washington when he learned that, although the Navy had invited two other manufacturers to submit designs for the bomber, there still was a chance to salvage the $32 million contract.

In a Statler Hotel room, the trio labored over drawings all night long, and by dawn they had a new airplane pretty well figured out. That same day they showed their figures to the Navy and persuaded it to let Douglas participate in the competition.

Already approximately six months behind the other two companies, Heinemann hastened back to Los Angeles and put his staff to work. The plane the Navy wanted was one which could be used in the final attack on the Japanese mainland. It had to combine the function of three former types—scout, dive bomber, torpedo bomber. Engineering time on a new plane generally averaged 20 months. This one had to be engineered in five.

Remembering the sour experience of the SB2D, Heinemann pronounced the new doctrine for El Segundo's engineering division:

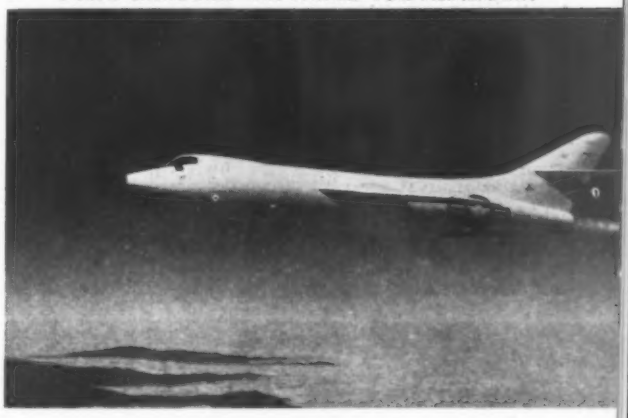
"Starting right now we keep things simple. Don't get cute. Don't try tricks. If you ask for a pound you don't need, I'll take a pound off your hide."

The El Segundo engineers took him at his word. The bomb bay was eliminated. Here, the external store became established. Bombs, rockets, and torpedoes were hung outside. Simple fuselage dive brakes were used; the old-fashioned tail wheel saved pounds. The airplane was as clean, simple, and functional as the best engineering talent could make it. It was 5000 pounds lighter than the nearest competitor.

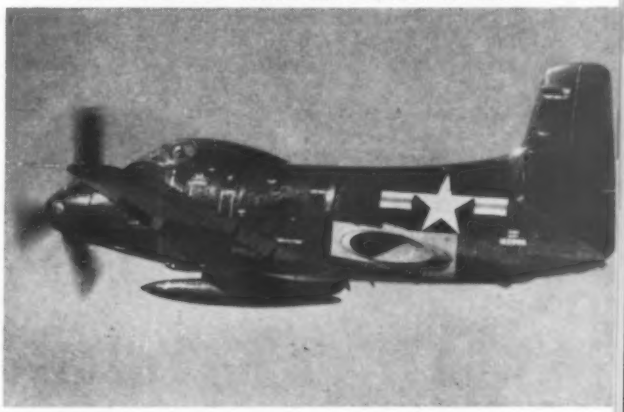
This was the AD Skyraider. It was designed and

BELOW: BT2D-1—DESIGN TO PRODUCTION, 8½ MONTHS

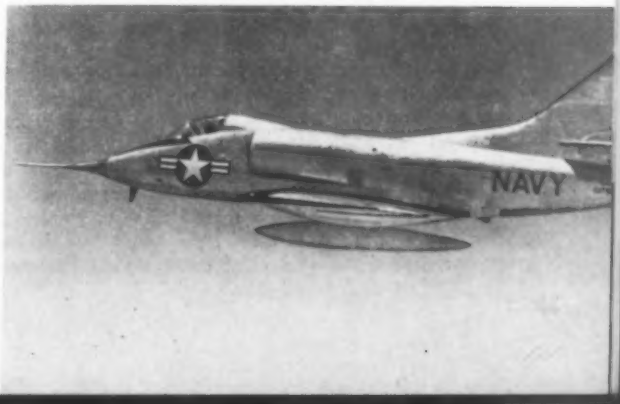
D-558-2 SKYROCKET—AN AWARD FOR HEINEMANN



A2D SKYSHARK—TURBOPROP ATTACK BOMBER



A4D—SMALLEST U. S. COMBAT JET



a prototype produced in 8½ months elapsed time. It beat out its two competitors both on performance and cost.

The Air Force and the atom bomb beat the Navy and the Skyraider to it in winding up the Japanese war. But the AD became the workhorse of the Navy's air war in Korea. Originally planned to carry a 2000-pound munitions load, Heinemann's weight program made it possible for the Navy to carry 4000, then 6000, and finally 8000 pounds under the AD wing. Before the war ended, one adventurous Marine flyer in Korea loaded on 9800 pounds (the striking power of a light cruiser) for the single Wright R-3350 engine to pack.

Heinemann was born in Saginaw, Michigan, of German-Swiss parents, in 1908. When he was six the family moved to Los Angeles. As a youngster he was interested in boats, but aviation fired his imagination in 1924 when Army fliers piloted three Douglas-built airplanes around the world in 175 days.

At 17, he set out to look for a job, armed with a letter from his high school mechanical drawing teacher which described him as a "highly capable draftsman." This got him his first job with Jim Yankee, builder of bus, fire engine, and truck bodies. Some of Heinemann's cake wagons, they say, still may be seen on Los Angeles streets.

Too busy for college

A year later, Heinemann caught on at Douglas. J. H. Kindelberger, now board chairman of North American Aviation but then chief engineer for Douglas, hired him as a draftsman at $18 a week.

"I decided," says Heinemann, "that if I was going to design planes, I'd better learn to fly them to see how they worked."

He took 10 lessons at $20 per lesson, then followed these up with three parachute jumps which cost $5 each for the equipment plus $10 for the ride.

Someone once asked Heinemann why he didn't go to college.

"I intended to," he replied, "but I was always too busy."

But just as he took flying lessons to learn about airplanes, he read books, attended seminars at the California Institute of Technology, worked punishingly long hours studying mathematics, aerodynamics, metallurgy, physics, chemistry, and meteorology to learn more about the art of flight. He made up for college the hard way.

In January 1932, Heinemann went to work for the newly organized Northrop Corporation, of which Jack Northrop was president and chief engineer. Douglas owned 51% of this company, which was located in a converted bus factory in El Segundo and later was to become the El Segundo division of the Douglas Aircraft Co. Among the planes Heinemann helped develop was the eight-passenger Northrop Delta, which TWA bought.

One day in 1936, Jack Northrop came to him and said:

"Ed, how would you like to take my place as chief engineer?"

Heinemann was 27 at the time. Even then he had strong convictions. "Do I get a free hand?" he demanded.

Thus the young engineer began laying the foundation for what today is regarded as one of the top aircraft engineering departments in the world. He began with a staff of 150. Today, it numbers approximately 1500. Actually, this is small measured by today's standards and compared to the department's accomplishments. Nearly 20,000 airplanes have come out the back door at Douglas El Segundo since Heinemann became the division's chief engineer.

Rate of turnover among engineers at Douglas El Segundo is low. The degree of reliability is high. It's obvious Heinemann knows how to make his department a good place to work.

There are no *staff* men in Heinemann's department. Everyone works at a job. No one works harder than the chief engineer, who will work around the clock if need be. Once when Douglas was given a contract to convert a Navy ship into an Air Corps plane, Heinemann took the stack of drawings, hunched over his drawing board, and worked 36 hours straight making changes.

Promotions are made within the ranks at Douglas El Segundo. That's the way Heinemann, himself, came up and that's the way the key men on his team came up. No El Segundo draftsman need seek out another company for advancement. All he has to do is demonstrate ability.

When new engineering graduates are added, Heinemann looks first for a good attitude. This is a reflection of his own early days.

In those lean days, before World War II quickened the pace of the air age, the Douglas El Segundo division, like everyone else in aircraft manufacture, was scratching for business, and expense accounts were mostly wishful thinking. Heinemann recalls that he frequently had to hitch-hike his way to Washington on ferry planes to talk to government officials. When a possible buyer would show up at El Segundo, "We'd invite him home for dinner, and cook it ourselves." Once when a Middle Eastern potentate showed up to inspect a plane, Heinemann and Leo Devlin had to pool pocket money to pay his bus fare back to the Biltmore Hotel.

Heinemann doesn't expect such sacrifices from the new men he puts on from time to time, but he'd like to know they have the proper temperament to play ball on the team. He expects them all to be executives some day.

Listen to everybody

El Segundo's chief engineer also has some advice for newcomers:

"Learn to listen to everybody. Talk to the chiefs (chief machinist mates) and to the mechanics. Listen all across the board. Then do the best you can."

For all his experience Heinemann is still listening. During World War II, he followed the Douglas planes right up to the front, talking to the men who were flying and maintaining them. Now, whenever he gets the chance, he's off to Navy air stations seeking suggestions and thoughts that might help make El Segundo's future designs correspondingly better. There is nothing snobbish about Heinemann in his listening characteristics. He'll listen to admirals, too.

In the nine years since the end of World War II, the Douglas El Segundo engineering group has been making aerial history with a new family of airplanes. One of these, the experimental rocket-powered D-558-2, won him the 1951 Sylvanus Albert Reed Award of The Institute of the Aeronautical Sciences. The high speed and altitude marks established by the research plane made public figures both of Designer Heinemann and Pilot Bill Bridgeman.

Heinemann had a little powerplant trouble a while back. Engines which were to power his new high performance aircraft, the A2D, A3D, F4D, didn't come up to expectations and Heinemann's boys, knowing his restlessness, were a little nervous about it. Fortunately, the Navy was able to come to the rescue with Pratt & Whitney's new J57 for the A3D and the F4D and the tension was eased.

"I wouldn't have put it past him," one of his engineers observed, "to have come in any morning with the announcement we were going to design our own engine."

What the man meant was that Heinemann is not at all averse to undertaking the design and manufacture of a component ordinarily left to suppliers or vendors who are specialists in their particular fields, if he feels it will improve performance, or save time, money, or weight, particularly weight.

Douglas El Segundo, for example, is making its own F4D-1 auto pilot. Actuators, hydraulic valves, bomb racks,

What's so difficult about making wing flaps?

Nothing, really. At least not for Twin Coach Aircraft Division. But then we've established a reputation for making hard jobs easy.

That's because we're *aircraft specialists*. Our five plants, covering 23½ acres, are devoted *exclusively* to production of airframe major assemblies. We build no other product. We do no other work.

So, if you have an assembly you're thinking of subcontracting, call us for consultation. We work right from your assembly prints, can design and make the tooling, jigs, fixtures. And we *do* deliver to specification and on schedule.

AA-58

Twin Coach Aircraft Division is the only subcontractor for Grumman S2F and Boeing B-52 flaps (*above*). We also make helicopter fuselages, main wing panels, complete center sections, wing spars, etc.

OTHER DIVISIONS OF TWIN COACH COMPANY MAKE:
Fageol Van Trucks, Fageol Gasoline and Propane Engines, Fageol-Leyland Diesel Engines

FAGEOL LEYLAND AIRCRAFT

TWIN COACH COMPANY
Aircraft Division BUFFALO, N. Y.

gun sights, ejectable seats, high-speed external stores, inertia reels for shoulder harnesses, and repackaging for radio and communications equipment are other components Douglas makes for the F4D-1.

There are a couple of classic stories regarding Heinemann's practical approach to designing airplanes. One has to do with two college-trained engineers overheard arguing heatedly about the best way to test an engine working platform for strength.

"Hell," said Heinemann, "jump on it. If it breaks, it's too weak." This technique has since become known as the "Heinemann Stomp."

Another time some of his men were trying to determine how much padding to put in to protect the pilot in case of a crash. Heinemann climbed into the cockpit and banged his head against the side several times.

"More padding," he said woozily.

An associate of Heinemann sums up his contribution to aviation this way:

"He never designs an average plane. He designs a bonus plane, with Douglas, the Navy, and the taxpayers all benefiting from the something extra. His planes are designed to do one job, but actually perform many more."

The last six production models turned out by Douglas El Segundo are said to have averaged 42% less weight than their competitors. At $40 a pound, this adds up to a tidy savings.

Heinemann still lives in a rambling, two-story house in the Baldwin Hills section of Los Angeles, which he built when he was earning $75 a week. Tragedy intruded into his private life when a daughter was killed in an automobile accident. His wife has been in ill health for several years. He has another daughter, who is married and lives with him. Not long ago a new grandchild arrived to brighten this scene.

His interests range from color photography to water skiing at Lake Arrowhead, but he still gets his greatest satisfaction out of putting in a full day's work from 8 a.m. to 5:30 p.m. at the office. This is a new office now and it's a most imposing symbol of success. One of the rewards of being a member of the successful engineering team at El Segundo is the opportunity to work in a brand new engineering building in which everything from the shadowless lighting to the air conditioning is the last word.

It's a fitting place for Heinemann and his associates to watch the progress of their latest gem, the 14,000-pound Navy A4D attack bomber, which epitomizes so well the Heinemann design philosophy of simplicity and low weight—especially low weight. • • •

West Coast Talk . . . By Fred S. Hunter

- **Who'll lead with turboprop transports?**
- **Is there a Super Nike?**
- **The T56's look good**

OUR TURBOPROP SPY—a very sharp guy—predicts this will be the order in which U. S. transport aircraft manufacturers commit themselves to definite turboprop programs: Convair first, Lockheed second; Douglas third.

When is all this going to happen? Well, folks, for Convair, practically any day now, certainly before the end of the year. Give Lockheed a little more time. Make Douglas—fat with DC-7 orders—later.

• •

WITH ITS YT56's looking so very, very good on the test stand and in the Convair YC-131C and the Lockheed YC-130, Allison, they tell us, is grabbing time by the forelock. It's replacing the T38's in its own Convair Turboliner with a set of the new T56's to expedite the accumulation of flight information. It's calculated prices, overhaul times, estimates of average overhaul costs, and other pertinent data required by the plane-makers, and is out selling hard. At last report, says our turboprop spy, engine price would be about $70,000 in limited production, $55,000 in volume, and propellers would cost around $35,000.

• •

SOMEBODY in the Air Force shows rare imagination in picking appropriate names for fighter modification projects. First there was project "Pull Out" on North American Aviation's F-86D's. Now a similar modification program to improve Lockheed's F-94C's has been dubbed project "Hop Up." Real cool, we say. . . .Western Air Lines president Terry Drinkwater proposed the lower level of the Key System Electric Line Depot for a consolidated airline terminal in downtown San Francisco, but got no takers on the theory it's not de luxe enough for the high class trade. The issue remains unresolved . . . Interior of a Seaboard & Western Model 1049D Super Constellation with 108 seats and no bulkheads looks like the inside of a theater . . . More turboprop news. Second Lockheed YC-130 is being prepared for flight . . . Test Pilot Roy Wimmer says the R7V-2 (with P&W T34's) accelerates from a standstill to 100 mph in 10 seconds.

• •

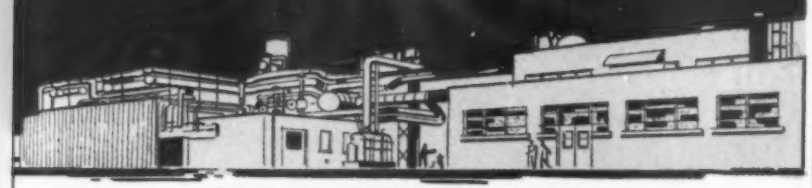
DOUGLAS phases out on the C-124 at Long Beach in April. They have turned out 300 or more C-124's and it has been a bigger revenue item than most people realized. The turboprop C-133 follows on at Long Beach. The XC-132, which the Los Angeles papers have difficulty in distinguishing from the C-133, is a Santa Monica Division project and is still in the mockup stage. The C-133 is substantially heavier than the C-124, but the XC-132 is bigger still. No orders for the latter yet. It awaits an engine anyway.

• •

QUESTION. Is there a super Nike? (Yep!) Just how luxurious are the interior fittings of President Eisenhower's new turbocompound Super Constellation? (You should see Mamie's dressing room, says our Lockheed spy.) Will North American Aviation, which missed getting the Collier Trophy for the performance of its F-86 in Korea, snag it this year for its supersonic F-100? (It qualifies for 1953 performance, since the first production model achieved level supersonic flight in December of that year, whereas Maj. Murray's 90,000-foot, or upward, altitude record with the Bell X-1A wasn't made until 1954. Maj. "Chuck" Yeager's X-1A flight comes under the wire, however.)

AIR-TURBINE DRIVES

by *Eclipse-Pioneer*



Country's most complete facility for research and development of air-turbine-driven equipment.

ADD

to ***PERFORMANCE***

... ***RELIABILITY***

... ***VERSATILITY***

SUBTRACT

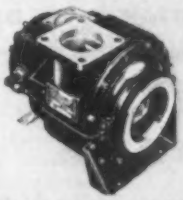
from ***WEIGHT***

... ***COST***

... ***MAINTENANCE***

Constant-Speed Turbine-Driven AC Generators

Air-Turbine Starters



Turbine-Driven Fuel or Water-Alcohol Pumps

Turbine-Driven Ram-Jet Fuel Pumps

plus many other turbine-driven accessories

Turbine-Driven Cabin Air Compressors

Have you considered the advantages of driving your air frame and engine accessories by air?

Compared to other existing drive systems, Eclipse-Pioneer Air-Turbine-Driven units . . . including constant-speed drives . . . cost less and save up to 50% in weight. As desired, they can be supplied for mounting directly on the engine or at some remote location to suit space limitations. Relative simplicity of design permits replacement in minutes, and faster and cheaper overhaul.

E-P's air-turbine program is complete and covers a wide variety of functions, including ram air and engine-bleed, air-driven applications. And even as the most advanced units roll off the production line, research and development continue with vigor . . . investigating the practicability of bleed and burn systems . . . improving on limits of speed control . . . producing greater output in smaller packages.

With close to 40 years of specialized aviation accessory experience, we *know* the accessory business. And because we *know* accessories, we design and build our turbine drives with accessory requirements always firmly in mind.

Whether your requirements call for an accessory with integral air-turbine drive, or an air-turbine drive by itself, E-P can suit your needs precisely. Write today for further information and for illustrated brochure, "Air-Turbine Facility".

Eclipse-Pioneer

TETERBORO, NEW JERSEY • DIVISION OF Bendix AVIATION CORPORATION

West Coast Office: 117 E. Providencia, Burbank, Calif.
Export Sales: Bendix International Division
205 E. 42nd St., New York 17, N. Y.

. . . world's largest producer of aviation instruments and accessories

Introducing THE GRAND CENTRAL

...Featuring the N

THE "SKYRAMA"... is an entirely new concept of the executive custom-built airplane deluxe. It combines great beauty and luxurious appointments with careful emphasis on cockpit layout and crew comfort, in addition to extraordinary maintenance features designed to save the owner time and money. The "SKYRAMA" is super-sound proofed throughout, including the pilot's cabin . . . is scientifically ventilated and equipped with four extra large panoramic windows, affording an unexcelled view in all directions. The Douglas DC-3 is recognized as the world's *most service tested* and *safest* airplane . . . The "SKYRAMA" is the last word in the modernization of this great airplane . . . MASTER CRAFTSMANSHIP FROM TIP TO TAIL.

THE "SKYRAMA" IS DIVIDED INTO THREE EXQUISITE SECTIONS

1. ***The "SKY-ROOM"*** . . . a carefully engineered and *completely new* re-manufactured nose makes possible *for the first time,* the sensational new "SKY-ROOM," with its deluxe observation compartment for four passengers *directly behind the cockpit* . . . separated by plexiglass, it *is possible to observe the crew in action* and *have the same broad panoramic view ahead it enjoys* in addition to the full view observation through the large passenger windows on each side...NEW—SENSATIONAL—DESIRABLE!

2. ***The "SKY-CABIN"*** ...an ultra quiet secluded compartment, for six passengers, with divans comparable to the finest for sleeping or relaxing...four large 17"x17" full view windows...circulating fresh air, indirect fluorescent lighting and radio speaker reception.

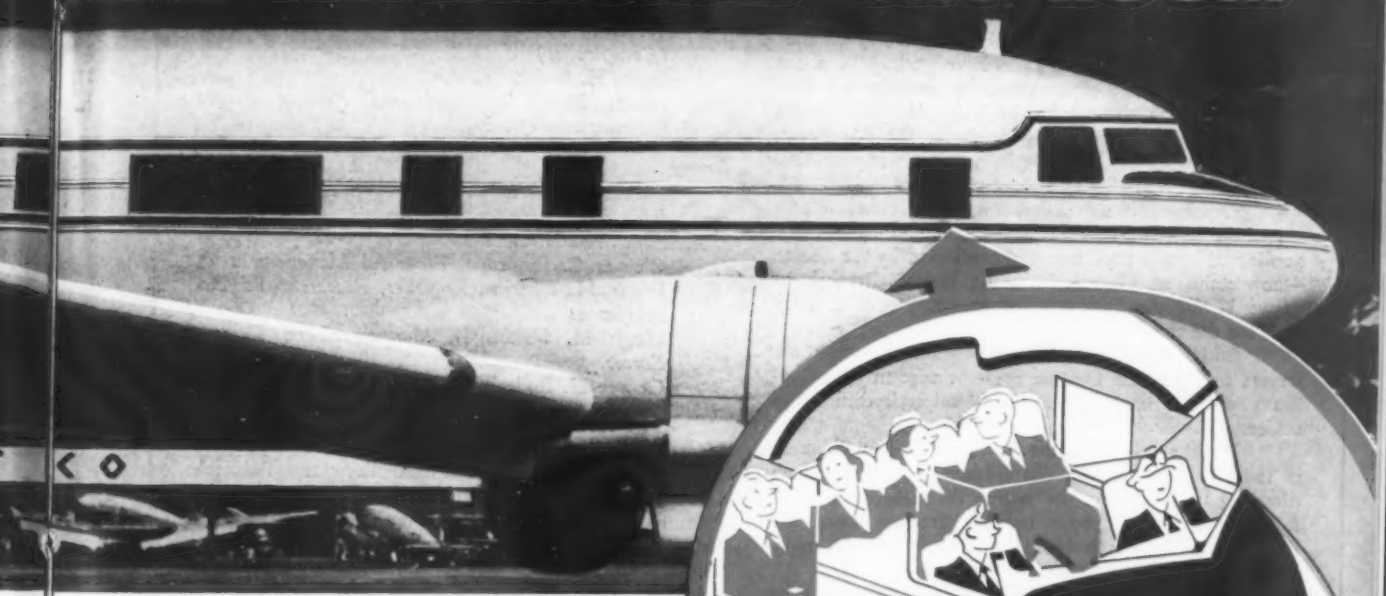
3. ***The "SKY-LOUNGE"*** . . . restrained modern decor with maximum comfort, convenience and great beauty . . . luxurious appointments for nine passengers that include: executive desk—radio and telephone . . . movable lounge chairs—reclining and swivel . . . window loge with unexcelled view through 17"x56" panoramic windows . . . last word in modern buffet styling—with cabinets and utilities . . . together with wardrobe, luggage and generous storage.

GRAND CENTRAL

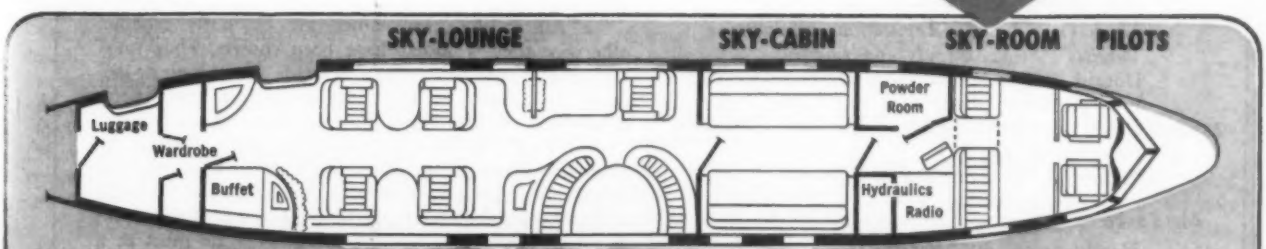
GRAND CENTRAL AIR TERMINAL . . . GLEND

SKYRAMA

NEW SENSATIONAL "SKY-ROOM"



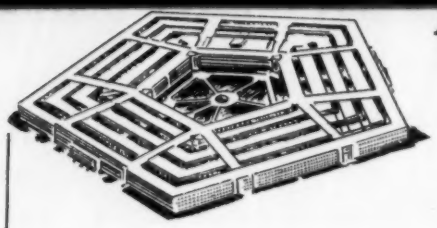
The "SKYRAMA" is the last word in DC-3 modification. It is designed with the latest and finest improvements to assure safety, speed, comfort, operation and maintenance economies. These new features include: retractable tail wheel — increased fuel capacity — electric steps — completely re-designed and improved hydraulic system — enlarged windows — Grimes rotating beacon — special heating and air ventilation — new gross weight approval — longer range — increased speed . . . Here's a ship that you'll be hearing plenty more about . . . it marks another milestone in the development of executive type aircraft . . . so new and outstanding in its appointments that the conventional executive aircraft has been entirely outmoded . . . *an achievement out of unparalleled experience by GRAND CENTRAL AIRCRAFT CO., America's foremost Company specializing in Aircraft Engineering, Modification and Overhaul.*



WRITE or TELEPHONE . . . . W. M. CLOUGH, Vice President — Operations & Sales, for ILLUSTRATED FOLDER or for a DEMONSTRATION — CHapman 5-1222 or Citrus 3-1141

AIRCRAFT CO.

GLENDALE (Los Angeles County), CALIFORNIA



A MILITARY COMMENTARY

By Harry S. Baer, Jr.

Who's Who in the secretariat of the military services

AFTER SOME RESHUFFLING and recent additions in the Defense Department's growing secretariat, it seems appropriate to get up-to-date on who's doing what to whom in the Pentagon's top civilian echelon.

A survey shows that Defense Secretary Charles E. Wilson's closest civilian aides have undergone about a 50% turnover in the past year, due entirely to voluntary resignations. Also, the addition of six assistant secretaries to the services—two each for the Air Force, Navy, and Army—is bringing in new faces and causing some changes in individual responsibilities.

Present Defense Department personnel allowance in the civilian secretariat—those who have to be nominated by the President and confirmed by the Senate—now stands at 30 men, including Wilson. Breakdown shows 12 for the Defense Department proper and six each for the three services.

Initial reaction to the expansion by some observers was that the Defense setup was getting too top-heavy with civilian bosses. This reaction is difficult to understand.

With an organization as broad and complex as is today's U.S. military establishment, there is much directing to be done in many diversified areas. It follows that, to improve overall direction from the Pentagon, Wilson is justified in latching onto as many top-level civilians as he can.

And, it might be well to consider that salaries to be paid the six new assistant service secretaries amount to $90,000 a year—a drop in the bucket when compared with the $35.5 billion which they will help spend in the overall Defense Department program this fiscal year.

Here's the present lineup of civilian secretaries of the Defense Department and the services:

Defense Department

Charles E. Wilson, *Secretary*
Robert B. Anderson, *Deputy Secretary*
Assistant Secretaries:
Dr. Frank B. Berry, *Health and Medical*
Franklin G. Floete, *Properties and Installations*
H. Struve Hensel, *International Security Affairs*
Wilfred J. McNeil, *Comptroller*
Frank D. Newbury, *Applications Engineering*
Thomas P. Pike, *Supply and Logistics*
Donald A. Quarles, *Research and Development*
Fred A. Seaton, *Legislative and Public Affairs*
Carter L. Burgess, *Manpower and Personnel (nominated Sept. 20)*
Wilber M. Brucker, *General Counsel*

Air Force

Harold E. Talbott, *Secretary*
James H. Douglas, *Under Secretary*
Assistant Secretaries:
Roger Lewis, *Materiel*
Lyle S. Garlock, *Management*

Navy

Charles S. Thomas, *Secretary*
Thomas S. Gates, Jr., *Under Secretary*
Assistant Secretaries:
Raymond H. Fogler, *Materiel*
William B. Franke, *Financial Management (Comptroller)*
James H. Smith, Jr., *Air*
Albert Pratt, *Personnel and Reserve Forces (nominated Sept. 20)*

Army

Robert T. Stevens, *Secretary*
John Slezak, *Under Secretary*
Assistant Secretaries:
Charles C. Finucane, *Financial Management*
Frank H. Higgins, *Logistics, Research and Development*
Hugh M. Milton II, *Manpower and Reserve Forces*
George H. Roderick, *Civil-Military Affairs*

The roster is complete except for the Air Force. Here, of course, Trevor Gardner's failure to receive Senate confirmation as Assistant AF Secretary (Research and Development) has snarled the picture momentarily. Presumably, he will continue to be Special Assistant for Research and Development, and the assistant secretaryship will be held open until it has been definitely determined whether or not he can be confirmed.

The fourth assistant AF secretary, although not yet named at this writing, will be responsible for manpower and personnel.

Among the civilian leaders listed, the following are new at their posts within recent months: *Defense*—Anderson, Berry, Burgess (nominated), Hensel, Pike, and Brucker; *AF*—Garlock; *Army*—Finucane and Higgins; *Navy*—Franke and Pratt (nominated).

The Assistant Navy Secretary (Air) title seems somewhat of a misnomer, particularly since this job is limited mostly to naval aviation research and development matters with no aircraft procurement involved. . . . Assistant Defense Secretary (Applications Engineering) function is somewhat vague, but it is designed to fall somewhere between Defense R&D and Supply and Logistics.

All of the men named are obviously capable; otherwise they wouldn't have been chosen. They must have met Wilson's five requirements for a man to become an assistant secretary. Speaking at a recent press conference, Wilson listed the requirements as follows:

"First, he must be an honest man. Second, he must know something about the kind of work that he is going to undertake and be very interested in learning more. And third, he must like the work; he mustn't think he is sick when he sweats. Fourth, he must be a man of good habits; he mustn't get drunk at the wrong time, or do disgraceful things. And the fifth one is that he must be a damn fool, otherwise he would still be on his present job." • • •

BuAer Wants All Supporting Equipment Delivered With Its Aircraft

New policy announced at Greer symposium on equipment and maintenance

By Joseph S. Murphy

ONE of the less glamorous and usually neglected elements of any aircraft procurement—that which deals with the ground support equipment needed to keep an operational aircraft flying—is getting top-level attention from the Navy Bureau of Aeronautics.

In a three-phase program soon to go into effect, BuAer plans to:

- Shift responsibility for procurement of all support equipment to the prime aircraft or engine producer.
- Provide automatic funding for this equipment at the rate of 2% of the prime contract dollar value. This phase will become effective with fiscal 1956 procurement.
- Procure larger initial quantities of special tools and ground handling equipment. Instead of a single prototype order as in the past, BuAer will provision up to six units, depending on the type of equipment involved.

Announcement of the switch in BuAer planning came recently during a symposium on aviation test equipment and maintenance sponsored by Greer Hydraulics, Inc. of Jamaica, N. Y., producer of 70% of all test equipment now used by the Bureau of Aeronautics. Navy officials explained that the ultimate aim of the program is to make prototype test equipment available in sufficient numbers and at the same time the first aircraft of a new type is rolled off the production line.

Deliveries were slow

Past practice of direct procurement from test equipment producers through the Navy contracts division has been too slow—so slow, in fact, that sometimes adequate test units would not be available for a year or more after a new airplane came into use. Contract negotiations alone often lasted from one to six months. First deliveries, usually at a stepped-up pace backed by high priorities, required still another 18 months.

Latest Navy policy, reportedly emanating from BuAer Chief Rear Admiral Apollo Soucek, is that new aircraft just won't be accepted as operational unless all the necessary support equipment is on hand too. To meet this objective, Navy plans will require prime contractors to develop test equipment as aircraft or engine development progresses so that a final design is available to the provisioning team along with the first "end-item."

During the three-day Jamaica session, the case for a more rational approach to the use of so-called universal test units was presented by Wray R. Hoffman of Westinghouse Electric Corp. aircraft gas turbine division. Although conceding that test equipment designed to special purpose requirements may be expensive, Hoffman warned that designs intended to do too many jobs are not without their shortcomings. The dangers, he emphasized, are that the universal test unit can become quite unwieldy, requires altogether too much set-up time to change operations, and is just not available when it is needed.

Greer has contract

In the direction of this universality, it was revealed that Greer Hydraulics now holds a Navy contract to study the extent to which hydraulic component test equipment can be standardized.

General Electric Co.'s J. W. Schweikert told the group that prime engine manufacturers are not only responsible for engine delivery but also for the test equipment to support its operation. Under these circumstances, he maintained that the engine producer should get the first opportunity to overhaul and service components, first to give him an accurate and quick picture of service difficulties that may arise, and second, so that he can learn as the Navy learns.

On the long-term maintenance of test equipment, it was brought out how U. S. Air Force practice varies widely from that of BuAer. Whereas the Navy calls on the original manufacturer for overhaul of test stands, USAF has been contracting with local job shops for major renovation of the complex test apparatus.

As a result of this practice, Greer Hydraulics, Inc. is establishing a network of authorized repair centers throughout the country in the interest of protecting the reputation of its equipment from any possible deterioration that might arise from overhaul operations outside of its cognizance.

In the "Things to be Done" category, Dean Smith, representing the Alameda Naval Air Station overhaul and repair facility, urged that manufacturers direct their efforts toward increasing the confidence of the operator in test equipment. Major areas cited were: improved ventilation against both the fire and toxic hazard, better gaging to ease the readability problem, more accurate tachometers for speed readings and settings, and improved tooling for stand operation and fixtures for attachment of test units.

Smith also voiced the need for manometer improvements to increase accuracy of settings either through magnification or by use of a different type of manometer. He proposed that test stand fluid temperatures be controlled automatically to speed up test work, and that some means be arranged to preserve hazardous fluids in test components after a test is completed and the accessory is dismounted from the stand.

Little hope was seen during the symposium for early advent of sparkproof tooling for greater safety of stand operation. Norfolk NAS, which has been evaluating special tooling of sparkproof materials for BuAer, reported complete dissatisfaction with their operation primarily because of their bulkiness. • • •

WHO WAS THERE

Prominent test equipment accessory and instrument producers contributing to discussions at the Greer symposium were:

- Commercial Research Laboratories.
- The Dennison Engineering Co.
- Fischer & Porter Co.
- Hamilton Standard Div., United Aircraft Corp.
- Heise Bourdon Tube Co.
- Manning, Maxwell & Moore, Inc.
- J. P. Marsh Co.
- Minneapolis-Honeywell Regulator Co.
- Potter Instrument Co., Inc.
- Reliance Electric & Engineering Co.
- Taylor Instrument Co.
- U. S. Electric Motors Co.

AF Ups Pace—10 Wings Due in 1956

The Air Force plans to add 10 wings during fiscal year 1956, which begins next July 1, in its buildup to 137 wings by July 1957, Gen. Thomas D. White, AF Vice Chief of Staff, said recently. Previously, only seven were scheduled to be added during this period.

Bob
Fink

What's behind the Broken Records?

They're coming so fast now they hardly make news. Records are made for speed, height, capacity – then smashed in short time by another newer, bigger commercial airliner. Back of these broken records is *brute power* – developed by ever greater, better engines . . . engines that *must* be protected against damaging heat and friction. Sinclair is proud of the part its Aircraft Oil plays in protecting these engines. *Today, more than 45% of the oil used by major scheduled airlines in the U. S. is supplied by Sinclair* . . . Proof positive of dependability.

SINCLAIR AIRCRAFT OILS

Sinclair Refining Company, Aviation Sales, 600 Fifth Avenue, New York 20, N. Y.

Show rooms and general offices have a modern setting.

Here's a New Business Flying Center

- **Van Nuys, Calif., has complete facility**
- **Variety of services provided by Larson Co.**

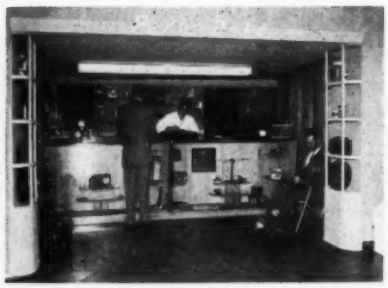
By Lois C. Philmus

AIRPORTS, although slow to awaken to the revenue-producing business flying group, have gotten started now. More and more airports are providing or preparing facilities for the exclusive use of business plane operators.

Probably one of the most complete and modern of the recently completed business flying centers is located at San Fernando Valley Airport in Van Nuys, Calif. Operated by the Norman Larson Company, the facilities represent an investment of about $500,000 and include an administration building, hangars, and other physical conveniences.

Business plane operators are provided with an attractive pilots' lounge. Visiting executives have a conference room at their disposal. A wide variety of visitor-service features include aeronautical charts, weather information, drive-yourself cars, and hotel reservations. Restaurant and bar are only a few steps away. Thirteen service personnel are on duty.

A Beechcraft distributor, Norman Larson, has provided a showroom big enough to display a Bonanza advantageously, and he plans on having a new plane exhibit on a regular basis. The showroom is also used for specially-built displays of Narco's DME equipment and other communication equipment and components. The sales staff has been increased to five under the managership of Jim Dyerly. Three persons man the large parts department, supervising a $60,000 inventory. Under the new arrangement Larson expects to increase his gross for the first year by 50%—to between $1-$1.2 million.



Parts and accessories are available.

Los Angeles Department of Airports participated in the new project by building the $200,000 administration building and hangars, which it leases to the Larson company. Larson pays a percentage of his gross in rentals, with a minimum of $900 per month established. In addition, the city gets 2¢ per gallon of Texaco gas sold by Larson and flight fees from the business aircraft using the center.

Besides the "extras," Larson provides for all aircraft and component maintenance, i.e., airplane overhaul, engine shop, propeller shop, and radio shop.

Accident Analysis

For the first time, the Civil Aeronautics Board has prepared an accident analysis report on executive aircraft. The new category is based on companies owning one or more aircraft flown by professional pilots hired for that purpose.

The report covers the years 1950-53 and reveals that company-owned aircraft were involved in 195 accidents during the period. Of the total, 28 were fatal, 10 serious, and 157 resulted in minor or no injury. The four-year breakdown is as follows:

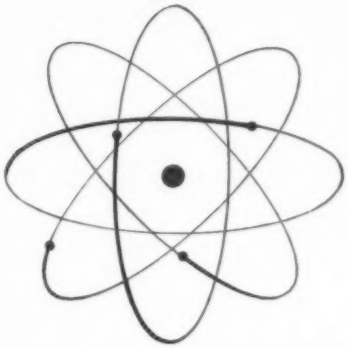
Injury Index	1950	1951	1952	1953	Total
Fatal	7	7	6	8	28
Serious	1	4	4	1	10
Minor/None	26	43	40	48	157
Total	34	54	50	57	195

Although the total number of accidents has risen, the number of individual fatalities has decreased from 49 in 1950 to 18 in 1953. The report states: "It would add value to the report if it were possible to correlate the accident totals to the exposure. . . . However, official statistics are not now available for this purpose."

Hourly figures available through private surveys, NBAA, and the Aircraft Industries Association for 1952-53 show sharp jumps in hourly usage and mileage flown, speaking well for the accident rate. Most recent figures published by AIA indicated that the business fleet flew about 6,450,000 hours in 1953 for a total of about 903 million business plane miles.

SUPER WIDGEON CONVERSION

LATEST improvement to the McKinnon-Hickman Super Widgeon conversion is the three-bladed Hartzell full-feathering props and the Lycoming Model GO-480B 270 hp engines. New props increase efficiency, cut down noise and tip speed. Maximum speed is 185 mph with cruise at 160 mph @ 65% power. Land take-off is 600 feet and water take-off is made in 10 seconds. The Portland, Ore., firm does the conversion with Jim Welsch Aircraft Sales as eastern representative.



POWER OF THE ATOM...

When will it be harnessed to aircraft? Here's an analysis of the major problems still to be solved—the conclusion of a two-part report

BY WALTER A. KILRAIN

LATE last month the first atomic-powered submarine, the U.S.S. Nautilus, was commissioned. With an underwater range limited only by the endurance of its crew, it marks the first significant breakthrough in the application of atomic power to transportation. How long it will be before the aircraft industry can follow suit and put a nuclear-powered aircraft into the air is obscured by the uncertainties of both research and security.

The date will be determined by the speed with which the engineers and scientists produce solutions to a variety of difficult problems (AMERICAN AVIATION, *Sept. 27*). Finding a suitable coolant that can handle temperatures in the order of 4000° F, and finding the most efficient combination of reactor, heat exchanger, and the engine itself, are two of the problems which are occupying some of the brightest young men of the Atomic Energy Commission, Pratt & Whitney, General Electric, Union Carbon and Carbide, Convair, Lockheed, Boeing, and, presumably, Glenn L. Martin, to name a few.

The problem of heat

Coolant problems of reactor design, difficult enough in themselves, become even more complicated when the designer attempts to carry off the heat without carrying off the fuel.

When a nucleus of U-235 is split by the entry of a neutron, it breaks into two relatively large particles, plus two or more free neutrons. The two large fragments may be any of a number of elements. (Examples: Krypton, with its nucleus composed of 94 protons and neutrons; Barium, with 140 such particles.) In this split, mass is lost since the neutrons and protons in an element with only 94 particles in its nucleus are individually of less mass than those in a U-235 nucleus, which has a total of 235 particles.

This loss of mass, multiplied by the square of the velocity of light, equals the energy that is generated *(Einstein's famous equation, $E = mc^2$)*. Eighty per cent of this appears in the form of the kinetic energy of the two large particles. These strike other atoms in the reactor, turning their kinetic energy into heat. Each nucleus that is split generates in this manner something like 3×10^{-14} BTU/fission. A pound of uranium provides 3.5×10^{10} BTU's.

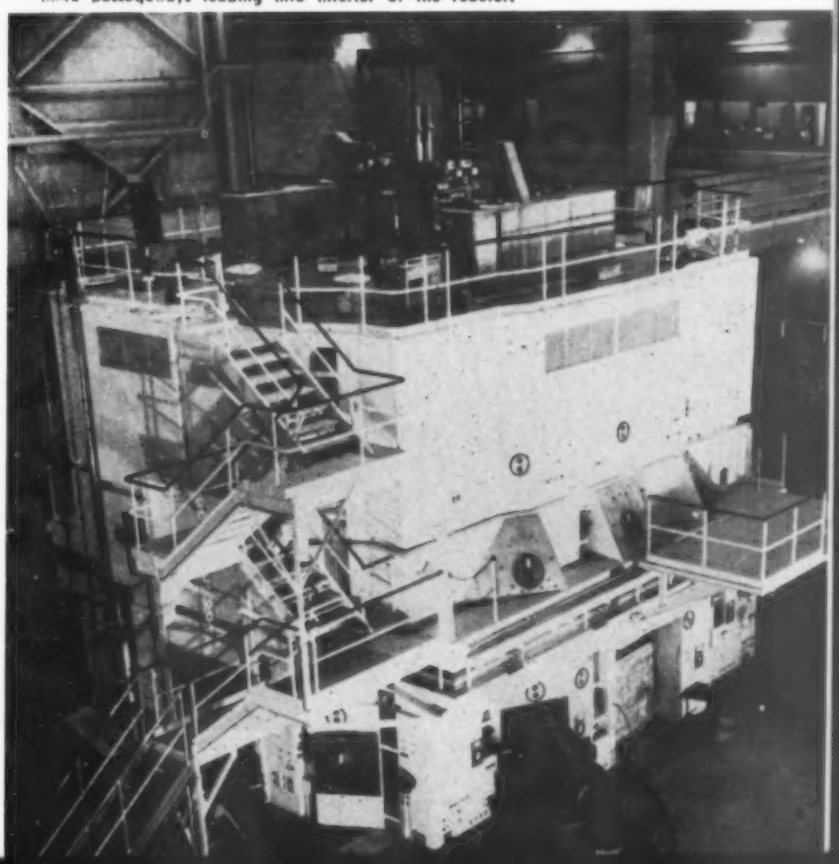
The absorption problem

To keep the reaction going, the two-or-more free neutrons (the average is 2.5 per fission) must continue to split other U-235 nucleii. If they are absorbed *(captured)* by other materials in the pile they will be taken out of circulation. If this happens too often the reaction will stop. The effectiveness of materials in capturing neutrons is described in terms of their "capture cross-section," a figure of speech which suggests that this capture depends upon physical size, although, as a matter of fact, it does not. When choosing a coolant to circulate through the reactor, the designer must find one that has a low capture cross-section so that too many neutrons will not be carried away.

One of the major problems in nuclear reactors thus becomes the investigation of coolants. In a series of experiments on lead-bismuth eutectic, NACA's Lewis Flight Propulsion Laboratory discovered that it could achieve results that came within 60% to 70% of theoretical figures for that material, which has the considerable advantages of low melting-point, low capture cross-section, and non-flammability.

In general the gases, like air, are

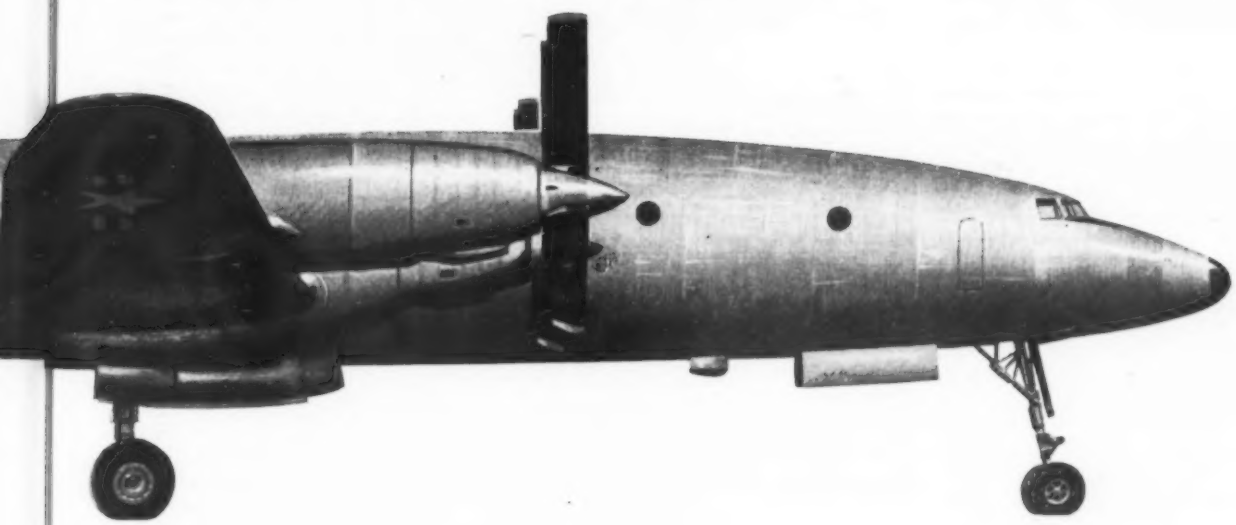
NUCLEAR "WIND TUNNEL." The Atomic Energy Commission's $18 million Materials Testing Reactor in Idaho is used to determine the effects of concentrated radiation on material properties, such as strength, ductility, etc. Since materials often change radically under atomic bombardment, such investigations are of prime importance, especially in the aircraft reactor program. Cannon-shaped object in foreground of photo is device through which test samples are inserted into the reactor. Circular openings mark passageways leading into interior of the reactor.



Now Flying !

LEADERSHIP DEMANDS CONSTANT ACHIEVEMENT

World's Fastest Propeller-Driven Airliner



Lockheed's Turbo-prop Super Constellation

Nearly 100 miles an hour faster than any propeller airliner now in service. This powerful new Super Constellation, equipped with American-designed and built Pratt & Whitney T-34 turbo-propeller engines, is now flying for the U. S. Navy. Its tests promise new speed, new performance, and greater economy potentials in the transport aircraft field. This new transport, Model 1249, is another example of Lockheed transport leadership. Watch for important news about this turbo-prop Super Constellation.

Lockheed *Aircraft Corporation, Burbank, California, and Marietta, Georgia*

LOOK TO LOCKHEED FOR LEADERSHIP

poor coolants from the point of view of heat-transfer coefficients. Organic chemicals tend to decompose at the high temperatures found in reactors. Liquid metals are expensive and demand special handling, and water, while good in some respects, must be kept under pressure to prevent it from turning into steam within the reactor.

One approach to the problem of cooling the reactor would be to provide a large number of cooling passages through it. However, as the number of passages increases the number of neutrons captured by the coolant also goes up. More fuel may then be needed to replace the neutrons that are being lost. With the addition of more fuel, the temperature goes up and the cooling problem becomes worse instead of better.

The corrosion problem

Coolant problems are not limited to high temperatures and neutron capture. Some coolants tend to dissolve metal from the walls of the cooling passages in the hot portions of the reactor and deposit it in cooler regions, thus blocking the passage in one point and weakening it in another. This is known as mass transfer. The problem of corrosion of the reactor material by the coolant and of escape into the coolant of radioactive fission products is also aggravated by high temperatures.

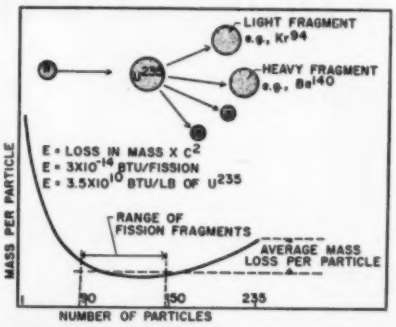
For testing coolant materials, NACA has developed a machine which consists of a doughnut-shaped tube filled to about 40% of its volume with the coolant under test. Heating coils and an air blast provide a temperature differential between portions of the tube. The tube is oscillated so that the fluid within it is rotated at a known speed, and measurements can thus be made of heat transfer and corrosion characteristics.

The problem of reactor structure

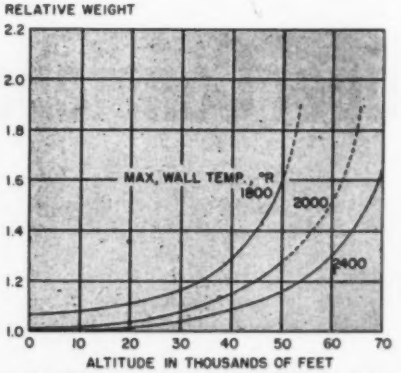
The problems of temperature and radiation that complicate the reactor's cooling system also have their effect on its structure. Fragments resulting from fission create the reactor's heat by striking atoms in surrounding material. Many of these atoms are moved out of their normal positions in the structure, and this alteration results in changes in the strength, elasticity, thermal conductivity, and other properties. Lubricants may solidify and electrical insulation may break down. Metals, as a group, expand as "incoming" neutrons displace their atoms. Studies of this effect by North American Aviation have shown that in copper, copper-iron alloys, and nickel, 25 to 30 electron volts is needed to move one atom.

If the structural properties of the reactor aren't adversely affected, the chain reaction may be, since some materials which work well under the temperatures involved have high capture cross-sections. A corrosion-resistant coating only a few thousandths of an inch thick may double the amount of uranium fuel needed. Ductility, too, becomes important, since materials must sustain thermal shocks when the energy level of the reactor is suddenly changed by the operation of controls.

"Aluminum has a very low capture cross-section and is a quite satisfactory material from this standpoint," Dr. Robert E. Lad, of the Lewis Flight Propulsion Laboratory, has revealed. "Unfortunately aluminum melts at 1200° F and hence cannot be used at the high temperatures desired in an aircraft reactor. Iron has a higher capture cross-section. . . . However, with careful design to avoid excessive amounts, it can be used as a reactor component. To get the high temperature strength . . . it is necessary to alloy iron with a number of other metals." Cobalt and lithium are two elements with attractive properties but with such high capture cross-sections that their use is difficult or impossible.



SOURCE OF ENERGY in nuclear fission is the loss of mass that occurs when U-235 nucleus splits into lighter particles, such as Krypton (with 94 particles in nucleus) and Barium (140 particles), plus two free neutrons. Mass is lost (transformed into energy) in this division, not merely rearranged, because each nuclear particle is lighter in Krypton and Barium than in Uranium, as shown by curve. Energy produced equals the loss in mass multiplied by the square of speed of light.



IMPORTANCE OF HIGH TEMPERATURES in reactor design is illustrated by chart above. If materials and techniques can be found which will allow a maximum reactor wall temperature of 2400° Rankin (1940° F) instead of 1800° R (1340° F), design weight of reactor, and hence of plane ,can be cut sharply. At an operating altitude of 50,000 feet, for example, the higher temperature would permit a drop in design weight from a relative 1.6 to 1.15.

Determining the capture cross-sections and other important nuclear characteristics of a wide range of materials is the job of the 30,000-kilowatt materials testing reactor in Idaho Falls, Idaho. Use of the MTR, which is run for the AEC by the Phillips Petroleum Co., has now been made available to the public on a fee basis.

"This reactor is of particular interest to the Air Force," observed the AEC's director of reactor development, Lawrence R. Hafstad, shortly after work was begun with it on April 4, 1952, "since it represents the boldest step into the unknown which we now dare to take, moving in the direction of compact, high-radiation-density reactors which must ultimately be developed if the Air Force needs are to be satisfied."

"The MTR will be to reactor development," predicted Hafstad, "what wind tunnels are to aircraft development."

The radiation problem

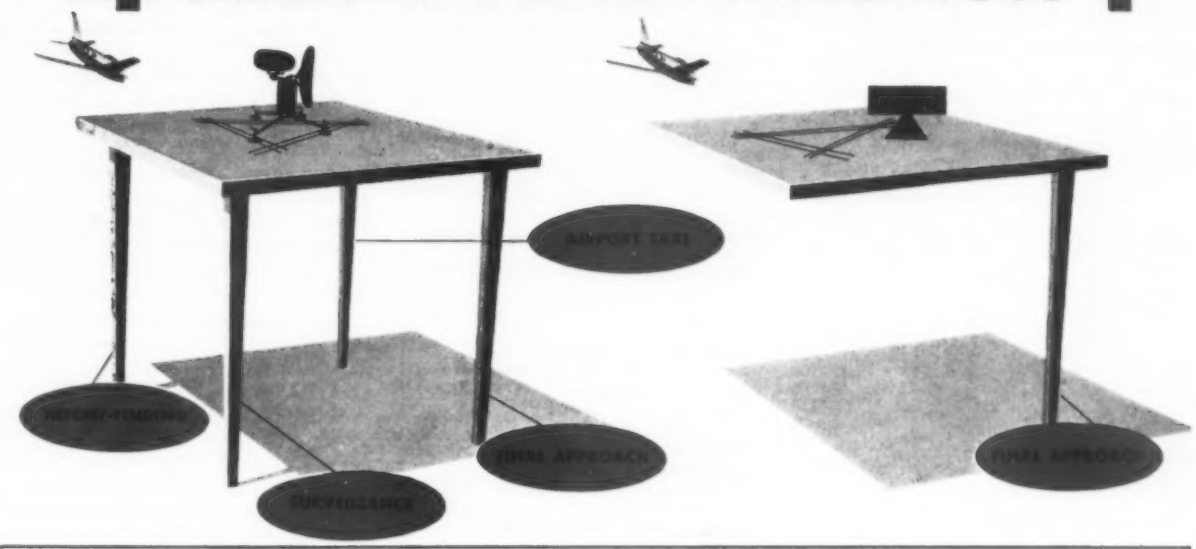
Shielding has probably received more publicity in connection with an airborne reactor than any other aspect of the program. Its difficulties are readily grasped: Large amounts of lead, concrete, or other dense materials suitable for shielding are among the last things that an aircraft designer wants to include in an airplane. In large enough quantities their weight would destroy the advantage gained by the use of extremely small quantities of fuel.

Fuel loads of modern airplanes range up into the neighborhood of 75 tons. Adequate shielding can presumably be designed in this order of weight, but exactly how much is needed is a question that remains to be answered. For one thing, it is not known precisely how much radiation is safe. One estimate has it that the equivalent of six or seven feet of concrete will be required. This rough figure, however, can be affected by many things, including the ingenuity that the engineers and scientists bring to the problem.

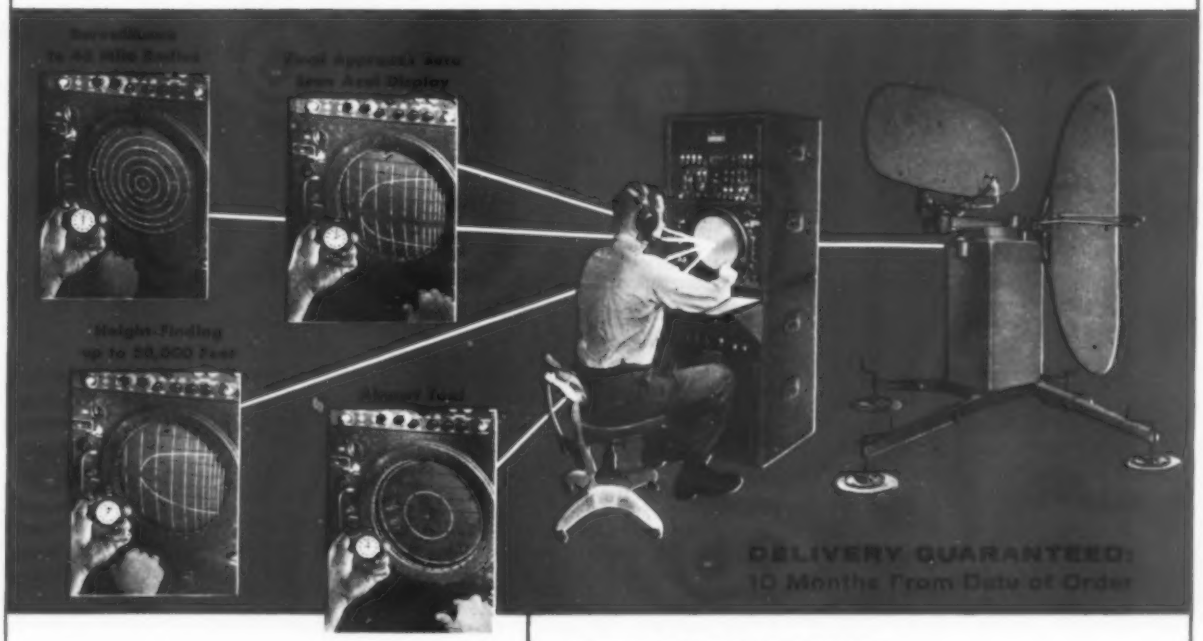
Two main types of radiation are involved: gamma rays and neutrons. The gamma rays can be stopped by some material like lead. A lighter mixture of water and boron might be effective enough in stopping neutrons. But the designer of an airborne reactor must decide how much of each type of shielding is needed and, if there is to be a sandwich structure, which layers are to go closest to the pile and which farthest away to achieve minimum

Which do you prefer—at no additional cost?

4 RADAR FUNCTIONS...OR 1



ONLY The Gilfillan GCA Quadradar Provides All 4 Radar Traffic Control Functions



Gilfillan
LOS ANGELES

SEND FOR BROCHURE

Please specify: Gilfillan GCA Quadradar-M (Military Equipment)
Gilfillan GCA Quadradar-C (Civil Airport)

Address: Gilfillan Brothers, Dept. AA-104, 1815 Venice Boulevard
Los Angeles, California

weight. Optimum design might turn out to involve one shield around the reactor itself and a second around the crew compartment, some distance away.

"The radiation intensities encountered in nuclear reactors must be reduced by factors of many billions before they are safe for the human organism," according to Andrew Kalitinsky, who served as chief engineer during Fairchild's operation of the NEPA project at Oak Ridge.

"A good [neutron] reflector may turn back as many as 90% of the neutrons escaping from the reactor. It would be very wrong, however, to assume that this would solve nine-tenths of the neutron shielding problem. It is more likely to represent only about 10% of the job of reducing the neutron escape to a tolerable level. . . . One might be tempted to consider a leakage of 1% as negligible, when in reality it might be more than a million times enough to kill you."

The weight problem

How much weight is allowable? If a gross of 100,000 pounds is assumed, calculates Benjamin Pinkel of NACA, and the lift-to-drag ratio is 20, one pound of engine thrust will be required to lift 20 pounds of the airplane's weight. At 30,000-feet altitude, a 5000-pound engine will provide this thrust.

If structural weight is assumed to be approximately 35% of the airplane's gross, structure—in this hypothetical case—totals 35,000 out of 100,000 pounds. Of the 65,000 pounds remaining, the engine takes 5000, leaving 60,000 for the reactor, shield, and payload. If an atom-powered plane with a gross of 100,000 pounds goes onto the drawing boards, it will be up to the engineers to find a way to keep the reactor, its shielding, and the payload somewhere in this range.

Cross country in 2 hours

Speculating on the arrival of military applications of airborne reactors within the next 10 years or so, Lockheed's Hall Hibbard continued in the prophetic vein. "Not too much later," he said, "I expect we will have solved the radiation and shielding problem to the extent that the first nuclear-powered supersonic commercial transport will be proven practical. It will fly at least two and perhaps even three times the speed of sound, crossing the country in less than two hours. . . . When this day comes to pass, nuclear-powered aircraft will have come of age with a vengeance; I confidently look forward to that time, because the nuclear-powered airplane is a practical device that is coming and coming to stay." • • •

Revamped ANDB—How It Functions

FIRST IMPACT of the six-month-old revitalization of the Air Navigation Development Board on the activities of the ANDB technical staff has come with the announcement by Director J. Francis Taylor, Jr. of a major organizational realignment.

To meet demands of a heavy active project list, supported by a beefed-up $4,570,000 budget from the Commerce and Defense departments, Taylor has revamped ANDB's staff into three distinct divisions. They are:

(1) Systems Requirements Group—Under Bert Denicke, former executive secretary of ANDB, this group will spearhead a move toward increased emphasis on operational aspects of ANDB activities. Main function will be to keep in close contact with the military services and with civil users of air navigation facilities and determine their operational requirements for a new aid—when it's needed, and its acceptable weight, cost, size, and performance.

(2) Systems Engineering Group—Headed by J. A. Anast, who joins the staff from the post of technical director, USAF Directorate of Flight and All-Weather Testing at Wright Air Development Center, this group will carry on the work of ANDB's former engineering staff in drawing up new equipment characteristics for prototype construction and evaluation.

(3) Project Coordination Group—This group, under former ANDB staff member C. S. Bartholomew, will maintain close liaison on development projects farmed out to the military services and CAA. New feature in this staff will be the addition of full-time liaison engineers furnished by the Army, Navy, USAF, and CAA to provide a direct technical channel between their agencies and ANDB on all outstanding projects.

Main points of emphasis in the new ANDB way of doing business, according to Taylor, will be:

- Increased attention to operational and application-engineering projects which should result in more immediate improvements in the current air traffic control situation. About 80% of ANDB program emphasis will be on ATC, 20% on air navigation.
- Close relationship with Air Coordinating Committee NAV Panel to keep abreast of Common System users' requirements in ANDB development planning.
- Better tie-in with all segments of aviation by encouragement of direct participation in ANDB work by industry representatives. First step in this direction was the recent assignment of S. P. Saint on the staff to represent the scheduled airlines.

Total dollar value of the Board's Fiscal 1955 program was placed by Taylor at about $4,570,000 with the USAF contributing $2,726,000 or almost 60%. Remaining funds are supplied by Commerce—$1,000,000; Navy—$450,000; and Army—$394,000.

• • •

PROJECTS NOW ACTIVE IN ANDB

Commerce

Radar Safety Beacon System
ATC Coordinating Equipment
Airways Operations Evaluation Center
ATC Simulation
Evaluation of DME-MOPAT
Evaluation of Alford VOR
Evaluation of Improved DME Ground Receiver
Bright Radar Tube Display

Army

Development of Increased Radar Echo from Small Aircraft (Corner Reflectors)
One Area MTE for ASR Radar
Helicopter Navigation Facilities
Bell Laboratories Systems Engineering

Navy

Radar Safety Beacon Systems
Aircraft Antennas
Helicopter Navigation

Air Force

Airport Surface Detection Radar (ASDE)
Procurement & Evaluation of Decca ASDE
Circular Polarization
ASR-3 Modification for Circular Polarization
PAR Modification for Circular Polarization
ATC Surveillance Radar Improvements
Air Traffic Data Displays
Determination of Slant-Line Approach Visibility
Study of Ground Traffic Control of Aircraft
Study of Airport Design for High Density Traffic
Flyability Correlation of Fixed Beam Approach Systems
Flight Experiments with Automatic Flare-out Control
ATC Environment for Operations
Ground & Flight Operating Procedures for ATC
Human Operator Job Capacities in ATC
Information Storage, Transfer and Display for Traffic Controllers
ATC Simulation Techniques
Improvements to Volscan (AN/GSN-3)
Automatic Traffic Flow Equipment to Assist Manual Controller
Research on Scheduling and Guidance Equipment

Engine Operation and Maintenance

Southwest Airmotive

DALLAS, Tex.—Any fears that Pratt & Whitney Aircraft is about to discontinue or even curtail spare parts production on its line of piston engines have been alleviated—at least for the time being.

In winding up its fifth consecutive year of engine operation and maintenance forums recently at Southwest Airmotive Co.'s Love Field facility, P&W gave the executive aircraft industry firm assurance that it does not intend to make any of its piston engines an orphan. The SAC-P&W-sponsored session, finale of the 1954 meetings, brought a record attendance of 150 corporate owners and pilots from eight southwest states.

Behind the vote of confidence in continuing production of piston engine parts was evidence that Pratt & Whitney had already considered and decided against closing down spares output on some engines at this time. Throughout the past year, P&W had reason for concern in view of the trend among executive aircraft pilots to "buy surplus" and to mix parts of surplus engines with the standard R-1830-92 engine for higher power operation.

Of equal concern to the East Hartford engine producer would be the reported increase in the number of requests to the CAA's powerplant engineering groups to approve replacement engine parts manufactured without P&W blessing.

R-2000's gain support

In contrast to the trend in R-1830 engine handling, the P&W-endorsed modification of Douglas DC-3 aircraft to use R-2000 engines continues to gain new supporters, the session heard. Executive aircraft incorporating the higher powered B-2000's now number five—Pan American World Airways has modified two and Pan American-Grace Airways has three in process. Sabena Belgian Airlines was due to test-fly a prototype of its version of the R-2000/DC-3 rework late last month, and Avianca was reportedly considering the change on its fleet of 40 DC-3's.

P&W officials reported that Northwest Airlines, continuing its pioneering work in flooded rocker box designs to combat exhaust valve failures and valve guide wear, has now modified two R-1830 engines to incorporate this fix and is operating them on service test. After considerable success by P&W on this rework, first on the R-4360 engine and later on R-2800 models, the program was continued by NWA on the R-2000, and the airline is completing the roundup of airline-type P&W engines with its test program on the R-1830.

Specific problems

On specific engine problems voiced during the SAC forum, P&W representatives offered these fixes:

• **R-1830 Cylinder Fin Breakage.** Usually the result of vibration, heat stresses, or a combination of both. Reduction in failures of this type has been achieved by use of Silastic fin dampeners to close up gaps between head baffles and fins. Although not adopted as standard practice in R-1830 engines, it has been used in some instances and P&W has no objection of its adoption.

• **Oil Changes.** There is no hard-and-fast rule as to the specific oil change period, but P&W feels a change at some interval can be beneficial. Best yardstick is that if the oil screen is becoming clogged and rocker boxes "coked" with carbon, oil should be

Airwork Corp.

MILLVILLE, N. J.—Record attendance greeted the fifth annual P&W engine operation and maintenance forum at the Airwork Corp. here. Heaviest representation came from owners of business aircraft, but aviation manufacturers, airlines, CAA, CAB, and military representatives (including the French and Uraguayan air forces) brought attendance to more than 120.

Following talks by Pratt & Whitney service specialists, the meeting was thrown open to a question-and-answer session which lasted almost two hours. Among the problems raised:

Q. What about oil additives?

A. P&W engines were designed for straight mineral oil. Over the years we have conducted tests on various kinds of moose juice. We just have never been able to find that they would do what they claimed. We have eliminated coking, incidentally, by use of the flooded rocker box, without any additive. P&W lists approved oils in its service bulletins. It would have no control over additives, and consequently can't approve any.

Q. How about combustion chamber cleaners?

A. We have looked into walnut shells and have no objection to their use. Some crop dusters apparently find them helpful. It's possible that it might not be necessary to go into quite such an elaborate operation. The Navy is running tests which are not yet completed. P&W hopes to learn something from them.

Q. What about idle mixtures at high-altitude airports?

A. That is a real problem for transcontinental carriers who land at Denver, for example, since there is no compensation in the carburetor for the change in pressure. Bendix has built a bellows device, under test for the last three years, which is designed to fit on the side of the carburetor and cope with that problem. If anyone is badly in need of one he might check into the possibility of getting one from Bendix on some sort of a service test arrangement.

Q. What is new in relation to the R-985?

A. There have been some failures in the last few years and P&W investigated. It was discovered that the majority occurred on engines *not* equipped with Hamilton Standard propellers. We have since issued Service Bulletin No. 1488 *(see story above on SAC-P&W meeting)* describing a modification that should be made to the root of the thread on the prop shaft at the next overhaul.

With the -72 engine, high cylinder-head temperatures are sometimes reported. In counteracting this condition make sure that the cylinder baffles are secure and that the thermocouplers are of the proper type. The lack of an O-ring in some carburetors has also been found to be the cause of high temperatures.

Moisture accumulation in spark plug barrels is common with operators who don't have pressurized systems.

Northeast Airlines had trouble, even with pressurization. Then they tested the ¾-20 spark plug which worked so well that they have eliminated the pressurization, at a considerable saving in maintenance.

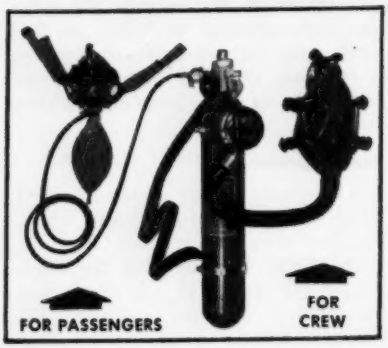
Q. Is high manifold pressure and low rpm less harmful than vice versa?

A. The R-2000 has a completely free range of rpm for a given power. However, two DC-4 operators who were cruising at 1800 rpm and having mechanical troubles found that the troubles ceased when they went to 2000 rpm. This is not conclusive, just a practical measure that may be tried if you need to.

Q. What's the maximum power on low blower for the -75 or -94?

Scott DUAL-PURPOSE

Portable Airline Oxygen



• This double-use oxygen unit provides complete smoke and fume protection for crew through demand regulator operation. Provides constant flow for passengers. Weighs less — takes less space. Used by all major airlines.

Write for complete information on model 5600 today!

SCOTT AVIATION CORP.

212 Erie Street Lancaster, New York

Southwest Airmotive from p. 53

changed. If engine operation is normal with none of these signs evident, no change is felt necessary.

• **R-985 Cruise Limitations.** P&W has rescinded earlier limitations on Beechcraft R-985 engine cruise settings of around 1900 rpm on the basis that a rework to the crankshaft, rather than an operating limitation, was the answer to failures experienced earlier. P&W Service Bulletin 1488 calls for rolling of threads at the thrustnut location where the failures occurred. This is being done on current production crankshafts and is recommended on used parts at next overhaul. The thread reoperation should extend crankshaft life. P&W says, and, although the airplane should not be grounded for the change, it highly recommends that it be undertaken at next overhaul. • • •

Airwork Corp. from p. 53

A. The maximum for either is 650 hp. The critical altitude in cruise, at 650 hp and 2250 rmp, is 14,000 feet with low blower and 18,000 feet with high.

Q. If you're using a -94 supercharger section on a -75 power section, when shouldn't you use high blower?

A. You should use low as much as possible since it delivers air to the engine at a lower temperature.

Q. What is the cause of excess bearing failure on the R-2000-7?

A. The power demand on the -3, -7, and -11 was such that the roller bearing used was a bit on the marginal side. Fitting limits must consequently be observed very closely on all three engines. There is nothing inherently wrong with the design, just a lot of power to handle. • • •

People

Manufacturing

Charles H. Shuff, formerly asst. to the president, and **C. V. Aggers**, formerly electronics dept. mgr., named director and asst. director, respectively, of defense relations dept. of Westinghouse Electric International Co.

Robert H. Davies appointed v.p.-engineering of The Parker Appliance Co. and its subsidiaries, from engineering mgr.

Herschel A. Wolf, formerly supvr. of aircraft radio for American Airlines, named ass't mgr. of aviation sales of Bendix Aviation Corp.'s Radio Communications Division.

Charles W. Sawhill appointed gen. sales mgr. of Aero-Coupling Corp., west coast subsidiary of Aeroquip Corp.

William O. Boschen, formerly eastern regional mgr. of Minneapolis-Honeywell Regulator Co.'s Aeronautical Div., now director of sales for Avien, Inc.

Leston P. Faneuf, ass't gen. mgr.,

Pike

Carlsen

Crum

Shuff

secretary & treasurer of Bell Aircraft Corp., elected a director of Associated Industries of New York State.

H. C. McDaniel has replaced C. A. Scarlott as Westinghouse Electric Corp.'s mgr. of technical information.

K. M. Miller, formerly mgr. of engineering for LearCal Division, named ass't gen. mgr. of Lear Inc.'s Research and Development Division.

H. Webster Crum, formerly sales mgr. for Goodyear Aircraft Corp., appointed v. p. and gen. sales mgr. of Lycoming Division, Avco Manufacturing Corp.

Carl A. Carlsen, formerly with Scandinavian Airlines and Air Associates, Inc., now Aircraft Sales Manager of Resistoflex Corp., Belleville, N. J.

Military—Government

Cmdr. John W. Freeborn reassigned from asst. Bureau of Aeronautics representative at Lockheed Aircraft Corp. to Hickam Air Force Base, Honolulu.

John P. Dennis, mgr. of the Texas Co.'s traffic division since 1948, appointed Coordinator of Defense Transportation.

Airlines

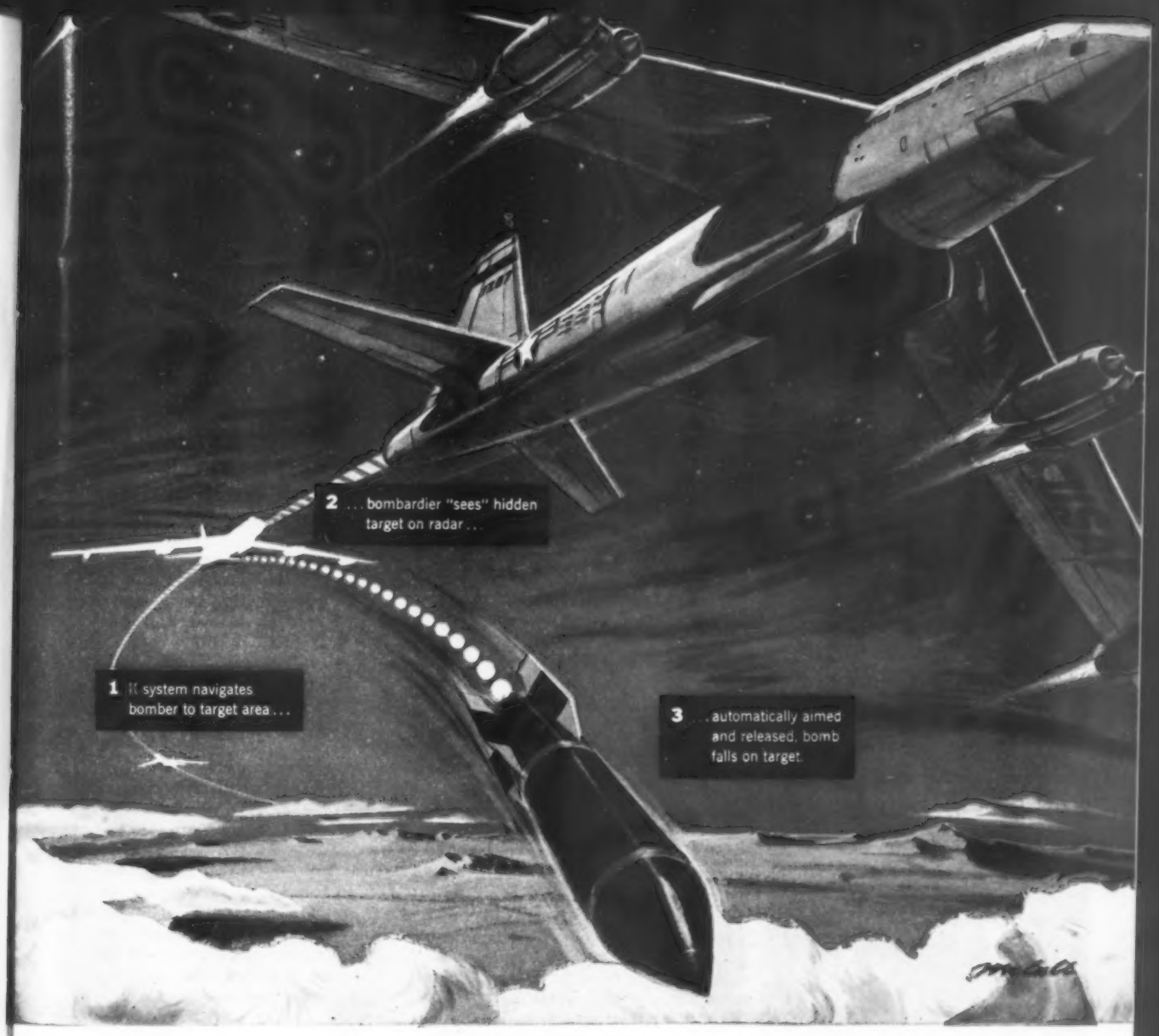
Max King resigns as v.p. of Southwest Airways October 15 to devote his time to the California political scene. After the fall elections he will be concerned with the broader aspects of aviation within the state of California.

Howard K. Pike promoted from chief engineer to director of maintenance & engineering for National Airlines, replacing C. H. Calhoun, resigned.

Frank Sharpe named gen. traffic mgr. of Eastern Air Lines from sales mgr., and **Warren R. Winn, Jr.**, formerly supt. of reservations & counter sales, named asst. gen. traffic mgr.

L. T. Long, formerly mgr. of engineering planning, appointed to the staff of J. A. Herlihy, United Air Lines' v.p.-engineering & maintenance, as head of personnel relations. **P. A. Wood**, UAL factory representative at Douglas Aircraft Co., is Long's replacement.

Andrew B. Shea, president of Pan American-Grace Airways, awarded Chilean Order of Merit, grade of Great Commander, for his work in developing Panagra which has served Chile for the past 25 years.


2 . . . bombardier "sees" hidden target on radar . .
1 K system navigates bomber to target area . . .
3 . . automatically aimed and released, bomb falls on target.

USAF DESTROYS UNSEEN TARGETS; PLANES USE RADAR BOMBSIGHT

THE STORY BEHIND THE STORY:

■ You've read headlines like the one above, reporting the precision of Air Force bombing—during tests. Within hours after an aggressor attack, you would read them again—reporting deadly counteraction. Night or day, regardless of weather, America can carry out its policy of instant retaliation to any aggressor—in any part of the world.

■ Now in large-scale production, the Air Force K Bombing System combines automatic navigation with all-weather identification and bombing of any target. With the aid of the Sperry Gyropilot* Flight Control and the K System, the crew flies the high-speed bomber to the target area. Using the Sperry-designed Bombing Navigational Computer, the bombardier locates the target optically, or if hidden, by radar. The effects of speed, altitude and wind on the falling bomb are automatically computed, enabling the bombardier to score direct hits. In simplifying the complex job of bombing at extreme altitude from high speed jets, the K System permits more time and flexibility on the bomb run . . . more certainty of "mission completed."

■ There's little resemblance between this automatic "brain" and the first bombsight developed by Sperry for use in World War I – a simple telescope and range scale no larger than an egg beater. But both were made possible because a military-industry team anticipated the needs of modern defense – then met those needs with a strategic bombing program which authorities credit with helping to prevent a new global war.

*T.M. REG. U.S. PAT. OFF.

SPERRY GYROSCOPE COMPANY

DIVISION OF THE SPERRY CORPORATION • GREAT NECK, N. Y.

Flush Fitting, Toggle Action
ACCESS LATCH

For exacting applications specify a Simmonds Access Latch. Precision engineered for high strength and light weight. Capable of handling structural loads, latch is simple, yet positive in action, both opening and closing at a touch. Body tested for ultimate loads up to 3000 pounds. For easy installation (flush) in panels, cargo doors, radomes, etc. Special adjustment features. If your latch problem is exacting, write for design portfolio on the complete line of Simmonds Structural Latches.

SIMMONDS
AEROCESSORIES, INC.
General Offices: Tarrytown, N. Y.
Branch Offices: Glendale, Cal. • Dallas, Tex. • Dayton, Ohio
Sole Canadian Licensee:
Simmonds Aerocessories of Canada Limited – Montreal

Extra Section . . .

By Lois C. Philmus

A civilized lightplane fly-in will do more to sell aviation than harum-scarum stunt performances

WE had our first opportunity to attend a mass lightplane fly-in recently when we flew up to Nantucket (via Northeast Airlines) to join the Aircraft Owners and Pilots Association seventh annual round-up flight. Although J. B. "Dock" Hartranft, president of AOPA, said it wasn't nearly the crowd that was expected (weather was threatening), we were still impressed. Watching 150 small planes coming in is rather impressive. Each plane averaged about 2.8 people (the .8 must have been the dogs and babies brought along for the outing).

The feeling is that maybe the air age is here for the average person. Instead of packing the wife and kids (and dogs) into the car for a weekend junket, these air-age husbands pack them into the plane and go off for a couple of thousand miles instead of a couple of hundred.

Exhibits and sales

Primarily social, the fly-in actually is an excellent showcase for the aviation supplier to show off his wares (and make sales) directly to the consumer. Exhibit booths were set up outside the airport administration building, with representatives of Air Associates, Lear, Airwork, Gossett Radio, Spot-Oil, and Piper present to answer questions, explain new equipment and services, and make over-the-counter sales.

Focal point, however, was the exhibit of new aircraft and the subsequent flight demonstrations. The plane owners were able to witness, in action, the new Mooney Mite, a Taylorcraft with flapping wings, a Piper Tri-Pacer and, of special interest—the Piper Twin Apache, which was seen for the first time by the majority. Because the fly-in had been held on the "weather" week end, the other plane manufacturers could not be present.

The most eye-catching flight was that of the Taylorcraft, which literally flapped its wings. It's been a couple of hundred years since this idea was first bandied about, but a gentleman from Pennsylvania revived it by permitting wing dihedral to change through a special strut attachment. The theory behind it, as we understand it, is to lessen the jolts encountered in rough air or turbulence spots. When you hit some roughage the wings move enough to counteract the motion.

(Until we realized what it was, our reaction was to ignore the fact that the wings didn't seem to stay level, but seemed to flap—after all, we'd turned in rather late the previous night.)

We were particularly impressed by speed runs made in the Piper Apache with Howard Groves, Piper pilot. On a speed run over the Nantucket runway, the indicator showed 178 mph at (if we remember correctly) 65% power. Single-engine performance was demonstrated by duplicating the speed run with the right prop feathered. Air speed hit 150 mph. Once more around had us climbing, circling, and coming in for a landing—still on one engine.

A Fiberglas plane

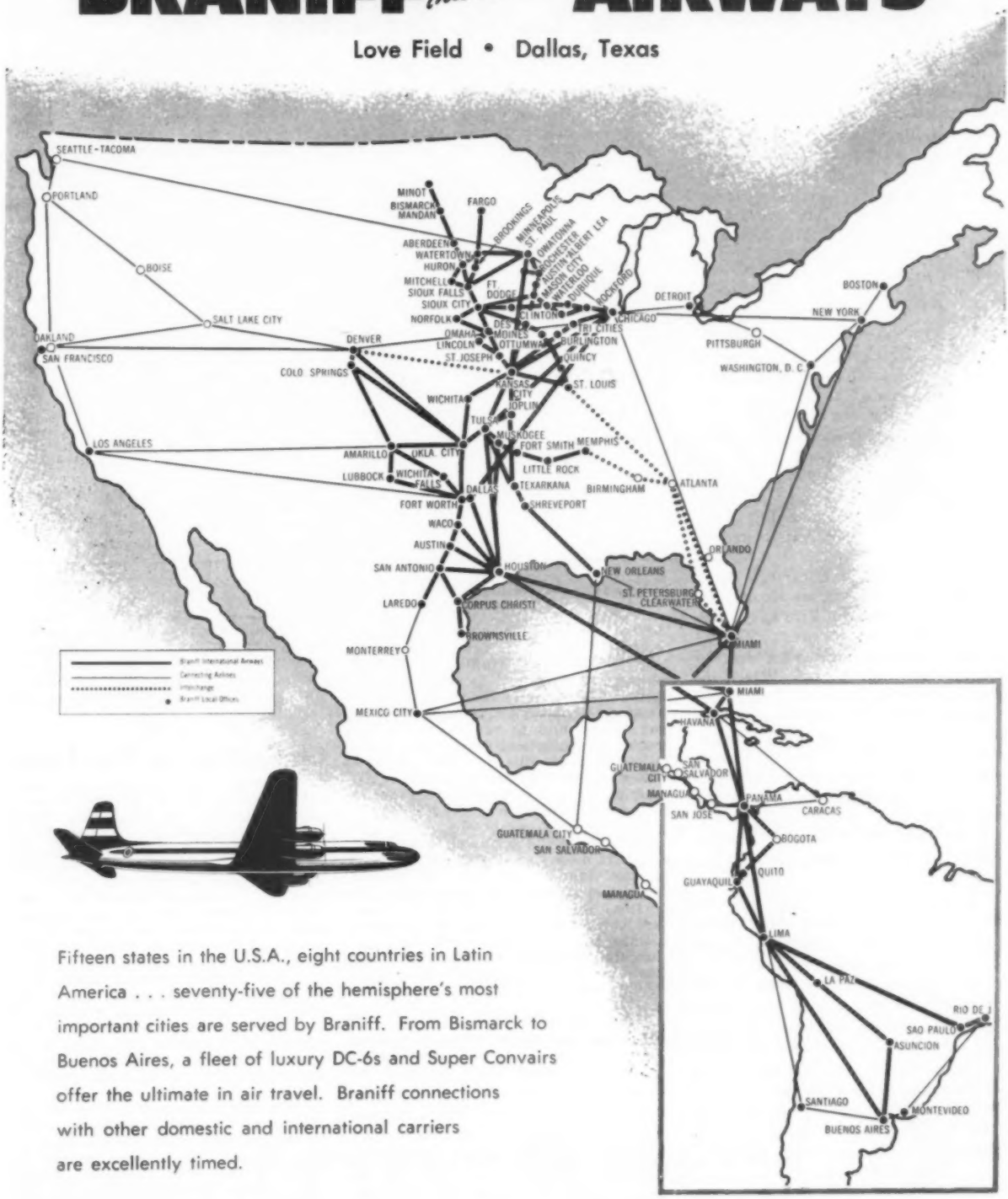
Neither seen nor described, but the subject of much speculation, was the all Fiberglas aircraft being cooked up by Taylorcraft in Conway, Penna. We called B. J. Mauro, president. He told us they are a few weeks behind schedule, although nothing is wrong. (The plane was originally scheduled to fly in August.) Mauro expects it to fly in the near future.

More such civilized fly-ins should be organized. They go a long way toward selling aviation and give aviation a chance to sell itself—much more so than the harum-scarum stunt performances which still are with us.

for friendly, reliable service on two continents

BRANIFF *International* AIRWAYS

Love Field • Dallas, Texas



Fifteen states in the U.S.A., eight countries in Latin America . . . seventy-five of the hemisphere's most important cities are served by Braniff. From Bismarck to Buenos Aires, a fleet of luxury DC-6s and Super Convairs offer the ultimate in air travel. Braniff connections with other domestic and international carriers are excellently timed.

AIRLINE COMMENTARY

• TRAFFIC • SALES • PUBLIC RELATIONS • *by Eric Bramley*

MANY AIRLINES are concerned about industry laxity in collecting excess baggage charges. With the check-in rush these days, laxity is understandable—agents with 60 people to check can't be bothered with the extra paperwork involved. Nevertheless, it's probable that you'll see a campaign soon to get every line to collect for that extra two or three pounds. Unless everyone cooperates, however, irate customers will claim (rightfully) that the other airline didn't charge them so why should they pay now.

* * *

U. S. immigration customs, and public health were blasted—but good—by Dr. W. C. Greet, a passenger on a Pan American tourist flight from Europe that landed at Pittsburgh last month during the east coast hurricane. The 77 passengers, after a rough 11-hr. ride, still weren't allowed out of the plane because Immigration said there were no clearance facilities at Pittsburgh. So they sat for almost three hours before the plane was cleared to New York.

Dr. Greet told a Pittsburgh paper later that the storm was an act of God, but "the reception in Pittsburgh was an act of man and shameful." The 77 he said, "roasted" and were left to "rot in their own juices." Planes diverted to Canada received "hospitable" treatment, he noted, adding caustically, "of course it all depends upon the competence of local officials beyond routine demands." Our observation has been that most U. S. officials don't go in for hospitality; they go strictly by the book and it's just too bad if the customers "rot in their own juices."

* *

Last issue we described a ride we had in a Bell helicopter at Ft. Worth with a Braniff hostess aboard, and noted that it had been described (in Texas) as the "first hostess service in a helicopter." Comes now a letter from C. M. Cowdery, National Airlines, Philadelphia, who says that in April 1954, NAL had stewardesses on helicopters (for familiarization) from Miami to West Palm Beach. We retire gracefully (but don't forget—we were served a snack. First meal service, maybe?).

* *

Well-deserved compliment: a station manager in the eastern U. S. writes that he receives lots of promotional material from other airlines. "Much of it goes directly into the circular file. Tom Dempsey of Continental, however, (and I haven't yet met the guy) continually sends out eye-catching (low-cost) items which certainly keep Continental in my mind."

Sales, Traffic, Promotion

Northeast Airlines is considering asking CAB for a 10% fare increase, but hasn't yet filed a tariff . . . NEA plans a series of ads (featuring Jacqueline Cochran, a director of the airline) to acquaint the public with its application for a route to Florida . . .

TWA is now offering to assist passengers in carrying bags aboard Martin airplanes and loading them in the cabin racks. We're told that the plan has increased use of the carry-on racks and reduced the number of bags that are checked . . .

Delta-C&S believes its Sept. 26 timetable is the first airline timetable to be printed in three colors. It features DC-7 "Golden Crown" service . . . Delta-C&S is erecting an $18,000 color "spectacular" display near the entrance to Chicago's Midway Airport. Display will be 53 feet long, almost 20 feet high: 14-foot golden crown and DC-7 symbol will be in double gold neon (five points of crown will flash off and on), with DELTA-C&S in 4-foot red neon letters across the top . . .

Central Airlines has started a "portable" passenger service training program. John Jones, training superintendent, is traveling the system training both sales and operations staffs in telephone technique, ticketing, reservations, etc. He takes a relief agent with him who mans individual stations while regular personnel take the course . . .

Northwest Airlines has introduced a "fly-now-pay-later" plan . . . **Western** has started non-stop DC-6B (one round-trip daily) service Los Angeles-Seattle. It's a "Californian" type orchids-and-champagne trip (similar service has also been extended to the Los Angeles-Twin Cities route) . . .

Allegheny and **Capital** will share costs of a cooperative advertising program in 18 AAA communities for three months starting next Jan. 1. Ads will feature connecting services of the two lines at Pittsburgh, Cleveland and Washington gateways . . .

United's "off-the-job" sales program, now in its seventh month, shows employee sales of $250,000 . . . UAL is releasing two new 16 mm. sound-and-color films, "The Sky is for Everyone," dealing with Convairs, and "Flying Colors," a tour of the San Francisco maintenance base. Both were produced under supervision of Bernard Kovnat, manager of promotional advertising . . .

Agents' Commissions

One of the hottest controversies in the traffic-sales field in recent years is coming to a head. It dates from April, 1953, when **Air Traffic Conference** adopted a resolution to reduce travel agents' commissions from 5% on domestic travel to a maximum of $1.50 on one-way tickets and $3 round-trip. Agents reacted violently and delayed the resolution by protesting to CAB. A committee of agents, airlines and a CAB examiner have been meeting periodically to try to arrive at a solution.

It's been no secret that some airlines voted for the resolution reluctantly, and that more had cooled off in recent months. Finally, on Sept. 22, **Capital Airlines**, opposed to the commission reduction, informed the CAB examiner that it wouldn't be bound by any compromise the committee might work out, that the resolution wasn't in the best interests of the industry, that CAB should hold a hearing and disapprove it.

And, on Sept. 27, **American**, originally in favor of the reduction, announced that it now wants to keep commissions at 5%. It asked CAB to take no further steps until the ATC meeting on Nov. 15 when AA will propose that the resolution be rescinded (vote must be unanimous) and that a standing agency-airline committee be set up to maintain a continuing study of relationships between the two groups. We understand **United** has also changed position and joined AA.

Opposition to Pay-Later

Although "fly-now-pay-later" plans are spreading, **W. A. Patterson**, president of United Air Lines, has voiced outspoken opposition to installment buying of travel. Transportation, he said in United Air Lines **News**, is something "that is gone immediately after it is used . . . It cannot be sold at a later date to recover part of the purchase price or to recover the balance of the payments that may be due . . . I think it is cruel to persuade people to create a debt for transportation (unless it is for an extreme emergency) which they might have great difficulty meeting and, as a result, deprive them of things they could use to greater advantage. I am bitterly opposed to turning a sales organization loose to persuade people to create unsound debts."

However, he noted that in the past he has had "strong views in opposition to many things which we are doing today because doing them became the lesser of two evils. Therefore, I could very quickly change my point of view. However, I much prefer to at least try to do what I think is right before capitulating to the actions of competitors."

HERE'S A REAL HOT "FLASH"

Slashing over enemy territory and thundering its way back with vitally needed intelligence data . . . Republic's **RF-84F THUNDERFLASH** is the latest addition to the long line of Thunder-craft. ➢ ➢ Fully equipped for any battle-front photo reconnaissance mission the RF-84F is capable of operations the clock around. More powerful than any of its battle-tested predecessors, the swept wing **THUNDERFLASH** is particularly well fitted . . . with protective armament, its tremendous speed and high maneuverability . . . to fight its way out of trouble, if and when necessary. ➢ ➢ Sturdy counterpart of the highly effective **THUNDERSTREAK,** this new plane. is being delivered in quantity to the U. S. Air Force. For more than a decade and a half Republic-designed aircraft have faithfully served our armed forces in the fight against tyranny.

REPUBLIC AVIATION

FARMINGDALE LONG ISLAND, N. Y.

Designers and Builders of the Incomparable **THUNDER-CRAFT**

Colonial Again Seeks Merger Partner; Alaska Proposes Stock Swap

TWO AIRLINE MERGER moves sparked developments in the last two weeks in CAB circles. One involved Colonial Airlines' third attempt to find a merger partner through the bidding process. The other, was an offer by Alaska Airlines to trade its capital stock for assets of Pacific Northern Airlines.

Colonial's move was in the form of invitations to Eastern Air Lines and National Airlines to submit sealed merger offers by October 20. The first time Colonial used the bidding method it accepted an Eastern offer which ultimately failed to get Presidential approval because of alleged "unlawful control" of Colonial by Eastern.

Following that action, Colonial renewed its efforts to get bids from Eastern and National this spring. On the afternoon the bids were to be opened, however, the deal was called off as it became evident CAB intended to press the control charges against Eastern.

Subsequently, CAB opened the way for Colonial and National to negotiate when the Board found that such a merger would be in the public interest. Though several months have elapsed since that action, there has been no evidence that Colonial and National have conducted successful negotiations.

Warning from Gurney

Prior to its latest invitation for bids, Colonial advised CAB of its plans in a move which drew a warning from CAB Chairman Chan Gurney that Colonial and Eastern must bear "full responsibility" for meeting previously stated conditions on the control question if a merger agreement is reached between those lines.

Gurney's remark was addressed to a Board order which indicated that it has not been determined satisfactorily that Eastern has clearly divested itself of control of Colonial.

Alaska Airlines' proposal, meanwhile, is the latest development in CAB's States-Alaska Case which is scheduled for oral argument this month. Alaska operates between Seattle and Fairbanks; Pacific Northern between Seattle and Anchorage. Both have additional intra-Alaska routes.

Both the CAB staff and CAB Chief Examiner Francis W. Brown have recommended renewal of PNA's route and non-renewal of Alaska's States-Alaska segment. But a possible merger of the two has been inherent in the proceeding from the beginning.

Alaska's proposal was mailed to PNA on September 27 in anticipation of a merger meeting scheduled between officials of the two lines in Washington on October 5.

Surviving company

The deal would be a swap of Alaska stock for PNA's assets on the basis of the fair market value of the two firms. As of June 30, PNA's market value, according to Alaska, was $2,399,895. ASA's was $3,298,544, including a tax loss carry-forward valued at $655,954.

Alaska said it would discount the difference and trade on a basis which would mean PNA stockholders would receive about .6 shares of ASA stock (market value more than $3) for each share of PNA stock valued at $2.25.

Proposal envisions acquisition of PNA by ASA with the latter as surviving company. A. G. Woodley, PNA president, would serve as chairman of the board of the new firm and Nelson David, ASA president, would continue in that capacity with the merged company, according to ASA.

PNA, which had been urging CAB to proceed with renewal of its certificate, had made no comment on the new ASA proposal at presstime. • • •

As of Now . . .

Status of the **Air Freight Renewal Proceeding** is very much up in the air. First phase of the hearings, involving north-south carriers, has no active domestic participants. U. S. Airlines, seeking renewal, has not operated for months. Riddle Airlines, which seeks U. S.'s certificate, is engaged primarily in U. S.-Puerto Rico services.

The second phase, involving so-called "east-west" carriers, hinges on CAB's treatment of the **Slick-Flying Tiger** merger abandonment proposal. If CAB denies the proposal, both carriers have threatened to quit the freight field.

The **New York-Florida Case**, in which a prehearing conference was held late last month, will be several months getting underway. Next step is a CAB order defining the scope of the case. A decision before 1956 is highly unlikely.

The **ATC Agency Resolutions Case**, embracing a CAB investigation of the airlines proposal to cut agency commissions, may soon be dismissed in view of the airlines' lack of enthusiasm for putting the lower commissions into effect. Travel agents had protested the move vigorously.

CAB Applications

National Airlines asked CAB to compel a Miami-New Orleans-Houston interchange between National and Eastern Air Lines or, in the alternative, extend NAL by exemption to Houston.

Capital Airlines applied to CAB for extension of its Route 55 south from Atlanta to Tampa and Miami and northwest from Pittsburgh to Detroit via Cleveland.

Allegheny Airlines applied for extension of its local service route from Erie to Detroit in response to requests from northern Pennsylvania cities for such a service.

North American Airlines asked CAB for authority to schedule flight crews for more than eight hours in its forthcoming transcontinental non-stop coach services slated for late this year with DC-6B aircraft.

CAB Calendar

Oct. 12—Hearing in Air Freight Renewal Case (North-South Carriers). Washington, D. C. Docket 4770 et al.

Oct. 12—Oral argument before the Board in States-Alaska Case. Washington, D. C. Docket 5756 et al.

Oct. 13—Hearing in Empresa Guatemalteca Foreign Permit Case (Guatemala City-New Orleans/Miami). Washington, D. C. Docket 6060.

Oct. 14—Oral argument before the Board in Braniff Airways Route 106 Renewal Case. Washington, D. C. Docket 6050 et al.

Oct. 26—Oral argument before the Board in Ellis and Alaska Coastal Renewal Case. Washington, D. C. Docket 6264 et al.

Oct. 28—Oral argument before the Board in North Central Airlines-International Falls Service Case. Washington, D. C. Docket 6563.

Recent CAB Decisions

Skytrain Airways' application for a U. S.-Latin America all-cargo certificate denied as carrier did not meet Board's tests of fitness, etc.

Pacific Western Airlines, Canada, awarded three-year foreign permit for irregular service between points in British Columbia, the U. S., and Alaska.

Pan American World Airways' certificate for South Atlantic service between New York and Johannesburg renewed until July 4, 1959.

Examiners Initial Decisions

Scandinavian Airlines System's trans-polar route application for service between Los Angeles and the Scandinavian countries recommended for approval for a three-year experimental period by Examiner Barron Fredricks.

FIRST

TO INTRODUCE THE DC·7

—AMERICA'S FASTEST AIRLINER

American, today, provides MORE DC·7 SERVICE TO MORE CITIES than any other Airline!

One reason why so many people fly American Airlines is the superiority of the Flagship Fleet, itself. City-to-city or coast-to-coast, experienced travellers know American offers only the finest and most modern of aircraft. First to introduce the DC-7, for example, American is also first in DC-7 operations with over 25 of America's fastest airliners serving New York, Los Angeles, Chicago, Dallas, Washington, San Francisco, Detroit, Tulsa and Fort Worth!

Americas Leading Airline **AMERICAN AIRLINES** INC.

Maintenance Bulletin Board

In-Flight Prop Reversal — What Happens

FOR the airline pilot who may sometime suspect he has experienced an in-flight propeller reversal, and for the ground mechanic who may troubleshoot for hours trying to track down the source of the problem, National Airlines has come up with a whole new set of answers. In short, the result of NAL findings: *There is no mistaking an actual in-flight prop reversal.*

National Airlines Engineering Report No. 226, which covers the prop reversal study, came into being on June 18, 1954 when the crew of one of its new Douglas DC-7 aircraft reported a suspected inadvertent reversal shortly before landing at Tampa, Fla. After subsequent flight tests which included six separate maneuvers and four actual propeller reversals, NAL found:

- An abraided Wirelon connector-covering on the lead from the propeller slipring to a blade switch caused the propeller reverse light to operate, not an actual reversal.
- Strong buffeting and inability to attain more than 1100 rpm with propeller in reverse during tests preclude the chance of the reversal having occurred on the flight in question. On that occasion the flight engineer had observed all tachometers reading 2400 rpm after the suspected reversal on No. 1 engine.
- Buffeting was relatively independent of power on the reversed engine and independent of speed over the range from 110 knots to 160 knots indicated. Considerable throttle opening was found to be required to prevent reverse rotation of the reversed engine.
- Yaw effect of propeller in full reverse at full throttle appeared moderate. The DC-7 was found definitely controllable directionally in this situation, and level flight could be maintained under these conditions:—

Engines—1—Reversed at full throttle—130 BMEP—980 rpm
Other 3 engines at 192 BMEP—2500 rpm
Airspeed—150 knots indicated
Altitude—6000 feet
Gross Weight—82,000 lbs.

Crew of the test flight was Capt. P. B. Wachtel (also pilot on the Tampa flight), M. C. Wedge, NAL assistant chief pilot acting as copilot, and L. J. Royall, assistant to operations manager, as flight engineer. After conducting a thorough ground inspection of the propeller electrical system without disturbing any essential programs, the crew, along with observers from CAB, CAA, and Hamilton Standard, proceeded into a multi-phase flight test.

First maneuver was to duplicate as closely as possible the circumstances of the Tampa incident but at a higher altitude. A second maneuver under similar conditions simulated the electrical short found during inspection which energized the propeller reverse light at about the 35° blade angle. Both maneuvers produced no unusual reaction.

In the third flight phase the No. 2 propeller was reversed in flight by means of a specially installed circuitry to ground the blade switch circuit. Upon reversal from a windmilling-throttle closed position, rpm increased from 2000 during windmilling to 2080 in one to two seconds, then fell off rapidly to 1500 rpm when the throttle had to be advanced to prevent reverse engine rotation.

Under these conditions the original rate of descent changed from 500 fpm to 1300 fpm, and the cylinder head temperature on the reversed engine dropped from 190°C to about 145°C after about two minutes.

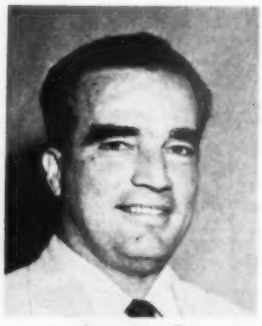
During the reversal the crew noted that the flat pitch or reversing sound was easily distinguished and lasted for about three seconds. When it stopped, a moderate to severe buffeting began, described by the crew as more severe than that produced by full cowl flaps on all engines, yet less than that of a full stall. It was not a control-surface type of buffeting, but more of a general nature felt throughout the airplane.

Observers viewing the wing tip during this operation reported that the wing did an oval gyration followed by a yaw movement as the propeller went into reverse.

After this first reversal at 110 knots indicated airspeed, the maneuver was repeated at increasingly higher speeds, first at 125 knots, then at 140. At the latter speed, when the propeller was reversed, the engine stalled and rotated one revolution backwards when the throttle was not advanced quickly enough after reversal.

Final maneuver in which the No. 1 engine was reversed brought a considerably more pronounced gyration of the left wing tip than observed when feathering the No. 2 engine. Although yaw effects were greater, the NAL crew found the airplane not difficult to control at 140 knot airspeeds. • • •

Capt. Wedge



Capt. Royall

Capt. Wachtel

Conclusion. You can't mistake a prop reversal

New Aircraft Projects

mean that we must constantly expand our creative engineering group. There are openings now for engineers experienced in vibration and flutter. *Must have a minimum of three years' experience.*

ENGINE AND AIRPLANE CORPORATION
FAIRCHILD
Aircraft Division
805 PENNSYLVANIA AVENUE
HAGERSTOWN, MARYLAND

The Most Trusted Name in Ignition

Pioneers in Development of Vibration-Resistant Electrical Connector

The unsatisfied demand for a rugged, dependable connector capable of meeting the exacting requirements of modern aircraft led the Scintilla Division of Bendix* to develop the *first* vibration-resistant electrical connector. These connectors using the revolutionary new insert material known as Scinflex were first used on Scintilla Division's ignition equipment for piston engines.

So outstanding was the performance of this new and better connector that its acceptance and use have now become world-wide. Today the Scintilla Division is a major contributor to the electrical connector industry.

This pioneering has never stopped. Bendix was first in the field with cadmium plated connectors, which were later made a requirement of military specifications. Our latest contribution is the best engineered closed entry socket contact available anywhere—one which cannot be mechanically overstressed.

*TRADE-MARK.

SCINTILLA DIVISION
of Bendix AVIATION CORPORATION
SIDNEY, NEW YORK

AVIATION PRODUCTS: Low and high tension ignition systems for piston, jet, turbo-jet engines and rocket motors . . . ignition analyzers . . . radio shielding harness and noise filters . . . switches . . . booster coils . . . electrical connectors.

Export Sales: Bendix International Division • 205 East 42nd St., New York 17, N. Y.

FACTORY BRANCH OFFICES: 117 E. Providencia Ave., Burbank, Calif. • Stephenson Bldg., 6560 Cass Ave., Detroit 2, Mich. • 512 West Ave., Jenkintown, Pa. • Brouwer Bldg., 176 W. Wisconsin Ave., Milwaukee, Wisc. • American Bldg., 4 South Main St., Dayton 2, Ohio • 8401 Cedar Springs Rd., Dallas 19, Texas

Bendix

with the

TEMPCAL

TEST OVER-HEAT DETECTORS and WING ANTI-ICE SYSTEMS ... RIGHT ON THE PLANE!

The TEMPCAL checks thermal switch and individual thermocouple ACCURACY.

TEMPCAL *functionally tests* thermal switches with their fire detection and anti-ice systems at their *operating temperatures* right on the aircraft .... and its relay circuit makes it possible to check *switches only* on or off the plane. Additionally, using a selected part of the TEMPCAL circuit, cylinder head temperature thermocouples and their circuits to the flight deck instrument can be checked.

ACCURACY—TEMPCAL Tester temperature readings are made on a highly accurate potentiometer; guaranteed accuracy is ±5°F with temperatures ranging from 0° to 800°F. Heater probes used for cylinder head thermocouples are guaranteed accurate to ±4°C at 0° to 300°C operating temperatures.

FASTER MAINTENANCE CHECKS—It is no longer necessary to take thermal switches to the "lab" for testing. TEMPCAL probes reach a temperature of 800°F in about 8 minutes for quick maintenance checks *on the aircraft.*

The production or maintenance engineer, pilot *and cost accountant* will readily realize the savings and safety factors resulting from TEMPCAL use. We invite inquiries concerning the TEMPCAL (as well as the JETCAL ..... for jet engine EGT system accuracy) *and will be glad to have our engineering department help solve your heat problems.*

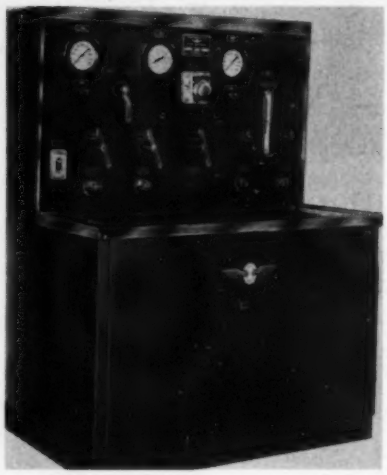
b·h INSTRUMENT

B & H INSTRUMENT
Company, Inc.
1009 Norwood
FORT WORTH 7, TEXAS

New Products

Hydraulic Test Machine

New low-cost stationary hydraulic test machine announced by Greer Hydraulics, Inc. operates at pressures up to 3000 psi and flows of 6 gallons per minute. It represents the first time quality hydraulic test equipment has



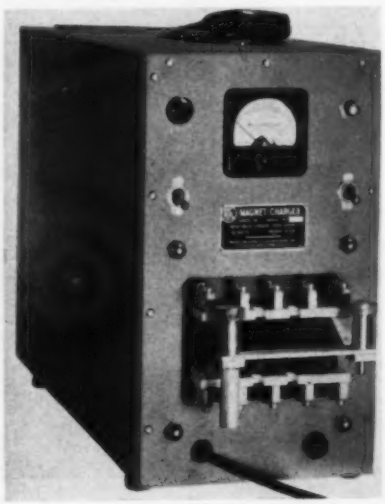
been offered for less than $2500, Greer officials said.

The tester is identified as the Model JK-100 and can readily be used by airlines in Skydrol fluid test applications. Power is supplied by a 15-hp, 1800-rpm, 220/440-volt, 60-cycle, 3-phase motor.

Circle No. 30 on Reader Service Card, page 77, for more information.

Magnet Charger

A new portable condenser discharge-type magnet charter announced by Radio Frequency Laboratories, Inc. has a 20% greater charging capacity than



its predecessor model. Weighing only 75 pounds, the new charger is called the Model 107A and operates from any 110/120-volt outlet. Power consumption is only 25 watts.

Circle No. 31 on Reader Service Card, page 77, for more information.

Heavy-Duty Lift

Vac-U-Lift, a new vacuum-operated hoisting device uses a flat metal plate with a flexible seat around its circumference instead of the usual suction cup design. A product of Blakeslee Manufacturing Co., Vac-U-Lift is powered by an 8.3-cfm-capacity vacuum pump which provides 28" hg maximum vacuum continuously.

Feature of the new design is the direct contact of the flat plate with the surface being lifted. This results in only a minute volume of air to be evacuated when vacuum is induced, thereby providing a high vacuum immediately, the manufacturer says.

Circle No. 32 on Reader Service Card, page 77, for more information.

Streak Camera

Control facilities have been added to Beckman & Whitley Inc.'s Model 168 streak camera providing a complete system for synchronized recording of position-versus-time data. The instrument plots on a 4" x 10" film with the vertical axis representing space and the horizontal axis representing time.

In operation, an external objective lens images the event on the camera slit and an internal lens forms an inverted image of the slit on a polished

steel rotable mirror. When the mirror is driven at its top speed of 50,000 rpm, the image is swept across the film at a writing rate of 5.46 millimeters per mircrosecond and a film length writing time of 44 microseconds.

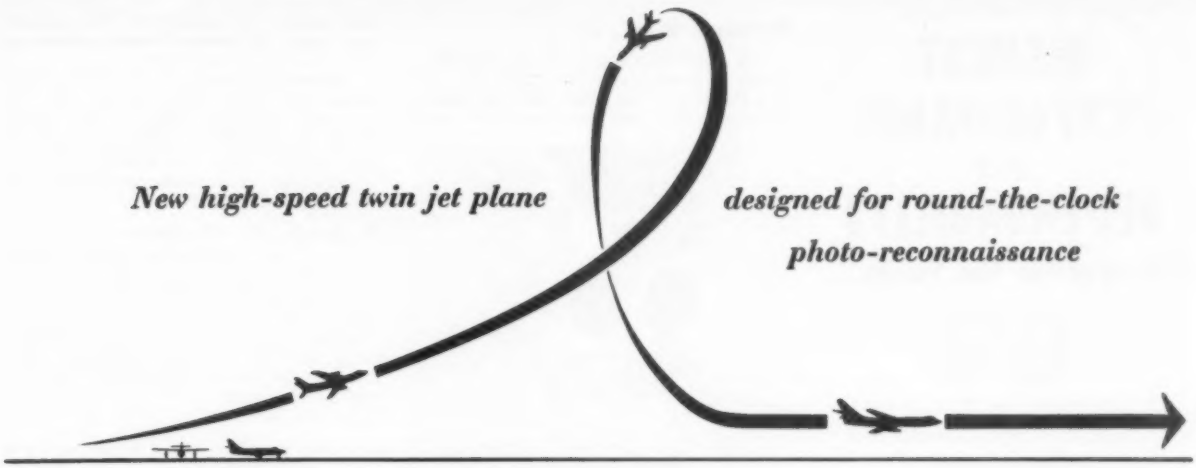
Circle No. 33 on Reader Service Card, page 77, for more information.

Crimping Tool

A pneumatically operated crimping device that weighs only 2¾ lbs. can be used to install Hylug and Insulug,

Crablok tip, and pressurized panel pins on aircraft cable sizes No. 26 through No. 8. Burndy Engineering Co., Inc.

Circle No. 34 on Reading Service Card, page 77, for more information.



—the Douglas RB-66

Now in production for the U. S. Air Force, the Douglas RB-66 will be one of the most versatile photo-reconnaissance planes ever designed.

Complete performance data is still restricted, but this much can now be told. Powered by twin jets, slung in pods from its sharply swept wings, RB-66 will fly in the 600- to 700-mile-per-hour class. Range will permit deep penetration for all-weather, around-the-clock photo-reconnaissance or mapping. Photographic equipment will be of the most modern to collect detailed information by day or night.

Development of RB-66 is another example of Douglas leadership in aviation. Planes that can be produced in volume to fly *faster and farther with a bigger payload* are a basic rule of Douglas design.

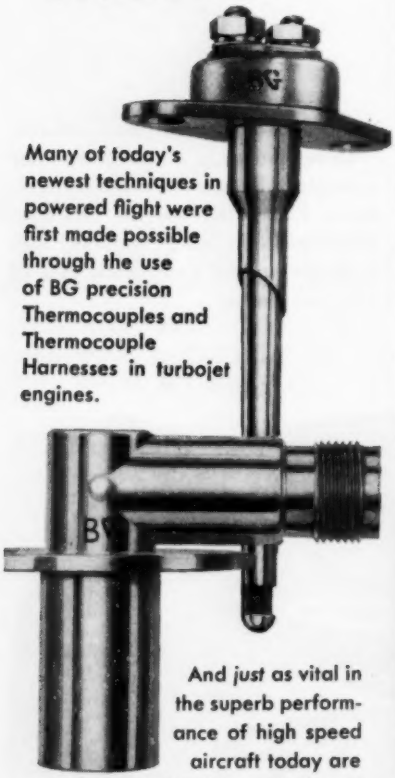
Enlist to fly in the U. S. Air Force

Depend on *DOUGLAS* **First in Aviation**

HIGHEST PERFORMANCE and DEPENDABILITY Throughout the Years...

BG

1954 marks the thirty-eighth consecutive year in which BG quality has led the field.



Many of today's newest techniques in powered flight were first made possible through the use of BG precision Thermocouples and Thermocouple Harnesses in turbojet engines.

And *just* as vital in the superb performance of high speed aircraft today are BG Turbojet Igniters — built and engineered for rugged service.

—BG—

the name that's first with aircraft engineering and maintenance personnel.

*

For information concerning these and other BG products, write to

THE BG CORPORATION
136 WEST 52nd STREET • NEW YORK 19, N.Y.

Pressure Blast, Jr.

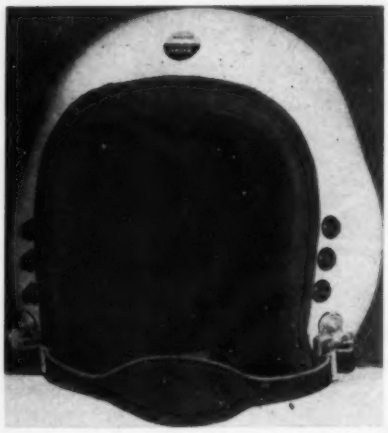
A low-cost version of the pressure-blast "wet-blast" units built by The Cro-Plate Co., Inc. for cleaning operations can be used in conjuction with

a 3-horsepower compressor. Unit operates on the aspiration principle which relies on a venturi in the blast gun to raise the abrasive and water mixture from the hopper.

Circle No. 35 on Reader Service Card, page 77, for more information.

Noise Helmet

"Sound-Absorb," a new helmet introduced by Bill Jack Scientific Instrument Co. for use in engine test cells or jet run-up areas features lightweight



construction. Included in its design is provision for standard radio earphones with basic helmet insulating qualities that permit clear hearing even in ambient noise levels of 150 decibles.

Circle No. 36 on Reader Service Card, page 77, for more information.

Small Capacitors

New capacitor series introduced by Condenser Products Co., division of New Haven Clock & Watch Co. is said to be almost 80% smaller than comparable designs for aircraft radio and radar use. Called the Glassmike TSG capacitors, new units use Teflon instead of mica for plate insulation.

Smallest model is a .0004 microfarad-type with 6000 effective working volts and a 2-amp rating at one megacycle. It measures 19/32" in diameter and is 1¼" long.

Circle No. 37 on Reader Service Card, page 77, for more information.

Portable Air Heater

Ease of conversion from electric motor to gasoline engine power, or vice versa, is featured in the new Herman Nelson utility model portable air heater. Output ranges from 75,000 to 425,000 BTU and can be regulated. A large-capacity fuel tank is designed for overnight operation without refueling. American Air Filter Co., Inc.

Circle No. 38 on Reader Service Card, page 77, for more information.

Magnet Amplifier

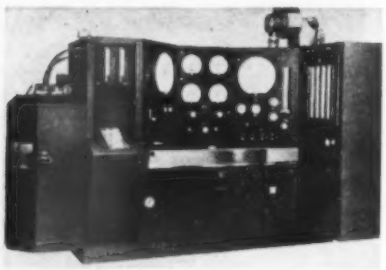
Airborne Accessories Corp. has developed a new rugged magnetic amplifier for its synthetic "feel" flight control systems. It is built around a saturable reaction wherein the laminated core of the reactor consists of a pile of thin rings made of specially processed magnetic material.

The core is wrapped with toroidal windings of magnet wire and the entire assembly is covered with a thermo-setting compound for maximum resistance to abuse.

Circle No. 39 on Reader Service Card, page 77, for more information.

Fuel-Nozzle Tester

A universal fuel-nozzle test stand being produced for USAF and Navy Bureau of Aeronautics is capable of testing any type and size jet engine nozzle, according to Commercial Re-



search Laboratories, Inc.

The type 416 stand is supplied with both a high-pressure flowmeter and a direct-weigh method, or with the flowmeter alone. When only the flowmeter is provided, all measurements are indicated in pounds per hour.

Circle No. 40 on Reader Service Card, page 77, for more information.

From Fargo to Norfolk to Wichita

local service airlines depend on

AEROSHELL OIL

THESE FOUR AIRLINES provide local service to the heart of the nation. Combined they travel thousands of miles . . . make hundreds of landings and takeoffs daily.

Short hops require that the engines frequently alternate between full throttle and idle.

This service calls for an oil that can take it . . . that can operate with the high lubrication efficiency that gives low engine wear. That's why so many local service lines depend upon AeroShell Oil.

SHELL OIL COMPANY

50 WEST 50TH STREET, NEW YORK 20, NEW YORK
100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA

SHELL

ROUTES OF THE
Californian
WESTERN'S FAMOUS
"CHAMPAGNE FLIGHTS"

EXTRA LUXURIES
...at NO EXTRA FARE!

★ Sparkling vintage champagne
★ Filet mignon dinner, gourmet luncheon or buffet
★ Orchids for the ladies
★ Reserved seats
★ Super-pressurized DC-6Bs

WESTERN
AIRLINES

Induction Heater

A high-speed induction heater which will heat a ⅜" titanium rod to 3400° F. in 9 seconds is being marketed by Radio Frequency Co. The new heater

is called the model 10,000 and consists of an induction coil, 10,000-watt air-cooled tube, mica silicone transformers, and heavy-duty, all-aluminum tank capacitor filled with dielectric synthetic Hectranol.

Circle No. 41 on Reader Service Card, page 77, for more information.

STATEMENT REQUIRED BY THE ACT OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946 (Title 39, United States Code, Section 233) SHOWING THE OWNERSHIP, MANAGEMENT, AND CIRCULATION OF

AMERICAN AVIATION published bi-weekly at Harrisburg, Pennsylvania, for October 1, 1954.

1. The names and addresses of the publisher, editor, managing editor, and business manager are: Publisher, Wayne W. Parrish, Washington, D. C.; Editor, Wayne W. Parrish, Washington, D. C.; Managing Editor, William D. Perreault, Washington, D. C.; Business Manager, Leonard Eiserer, Washington, D. C.

2. The owner is: American Aviation Publications, Inc., Washington, D. C.; Wayne W. Parrish, President, Washington, D. C.; Albert H. Stackpole, Vice-President, Harrisburg, Penna.; E. J. Stackpole, Secretary & Treasurer, Harrisburg, Penna.; Leonard Eiserer, Vice-President and General Manager, Washington, D. C.; Eric Bramley, Vice-President and Executive Editor, Washington, D. C.; Robert R. Parrish, Chicago Ill.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: None.

4. Paragraphs 2 and 3 include, in cases where the stockholders or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees hold stock and securities in a capacity other than that of a bona fide owner.

5. The average number of copies of each issue of this publication sold or distributed through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: 30,457.

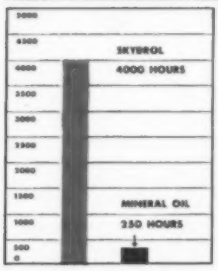
LEONARD EISERER,
(Signature of business manager)

Sworn to and subscribed before me this 20th day of September, 1954.

ROBERT C. BETTS,
Notary Public.
(My commission expires May 14, 1959)

Air Force Adopts SKYDROL For C-118A Superchargers

After test studies lasting more than a year, fire-resistant Skydrol hydraulic fluid is now specified for the superchargers of all new Douglas C-118's of the Military Air Transport Service. With this improvement, chemical-base Monsanto fluid will replace present petroleum oils.



SKYDROL OUTLASTS MINERAL OIL 16 TO 1

Saves taxpayers money. Skydrol has long been approved for 4,000 hours in Douglas cabin supercharger transmissions, compared with 250 hours for mineral oil fluids. Thus, fewer fluid changes and reduced servicing save the Air Force money.

Skydrol's lubricity is demonstrated by the longer service life of component parts in Skydrol lubricated systems.

Skydrol is noncorrosive to aircraft metals and alloys.

Skydrol is readily adaptable to all types of aircraft with minor changes to the hydraulic system.

Skydrol is stable at required operating temperatures and pressures.

Write for *24-page brochure containing technical data on Skydrol. Organic Chemicals Division, Monsanto Chemical Company, Box 478, St. Louis 1, Missouri.*

MONSANTO
CHEMICALS – PLASTICS

SERVING INDUSTRY... WHICH SERVES MANKIND

An Invitation To

AERODYNAMICISTS

You may well be one of a select group of men intently interested in developing tomorrow's jet fighters . . . special reconnaisance aircraft . . . jet bombers and transports. The Aircraft Division of Fairchild offers a genuine creative opportunity to such men.

New concepts of flight for the jet era . . . as well as engineering advances on the world-renowned C-119 Flying Boxcar and soon-to-be-produced C-123 Assault Transport are coming from Fairchild. Diversified, stimulating assignments like these increase the inventive challenge to Fairchild's team of qualified aerodynamicists.

Gracious country living only minutes away from urban Baltimore or Washington . . . paid pension plan . . . an excellent salary with paid vacations . . . ideal working conditions . . . generous health, hospitalization and life insurance . . . and the many other benefits of a progressive company add to the pleasure of working with Fairchild.

You'll be investing wisely in a secure future if you take time today to write to Walter Tydon, Chief Engineer, outlining your qualifications. Your correspondence will be kept in strict confidence, of course.

ENGINE AND AIRPLANE CORPORATION

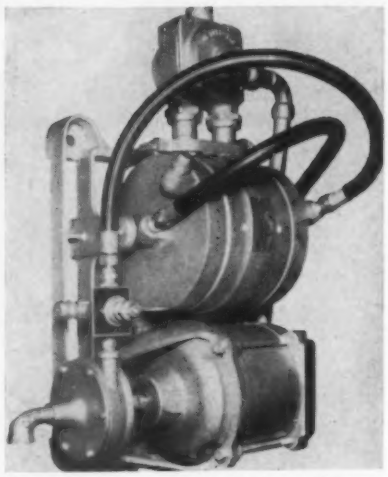
FAIRCHILD

Aircraft Division

HAGERSTOWN, MARYLAND

Hot Spray Heater

A new all-electric hot spray paint heater known as the Circaflow 600 has been announced by Spes-Slo Co. The new unit combines a coilless heat ex-



changer with an electric-powered centrifugal pump to maintain a uniform temperature at the spray gun at a constant pressure.

Circle No. 44 on Reader Service Card, page 77, for more information.

Passenger Seat

New deluxe cabin seats developed by Hardman Tool & Engineering Co. are rated for 9g loads and weigh under 68 lbs. in the double-chair style. Identified as the Model 3038-D series, the new

seats feature folding legs and backs for optimum stowage. Design is being adopted by Pan American World Airways Pacific-Alaska Division in Boeing 377 aircraft.

Circle No. 45 on Reader Service Card, page 77, for more information.

Classified Advertisement

AIRLINE SEATS

for DC3—DC4—DC6, and Lockheed Constellation

Warren McArthurs, Hardman, Douglas and Payloads. LO and HI density — Singles, doubles, triples. Delivery from stock.

TRANSPORT AIRCRAFT—ENGINES

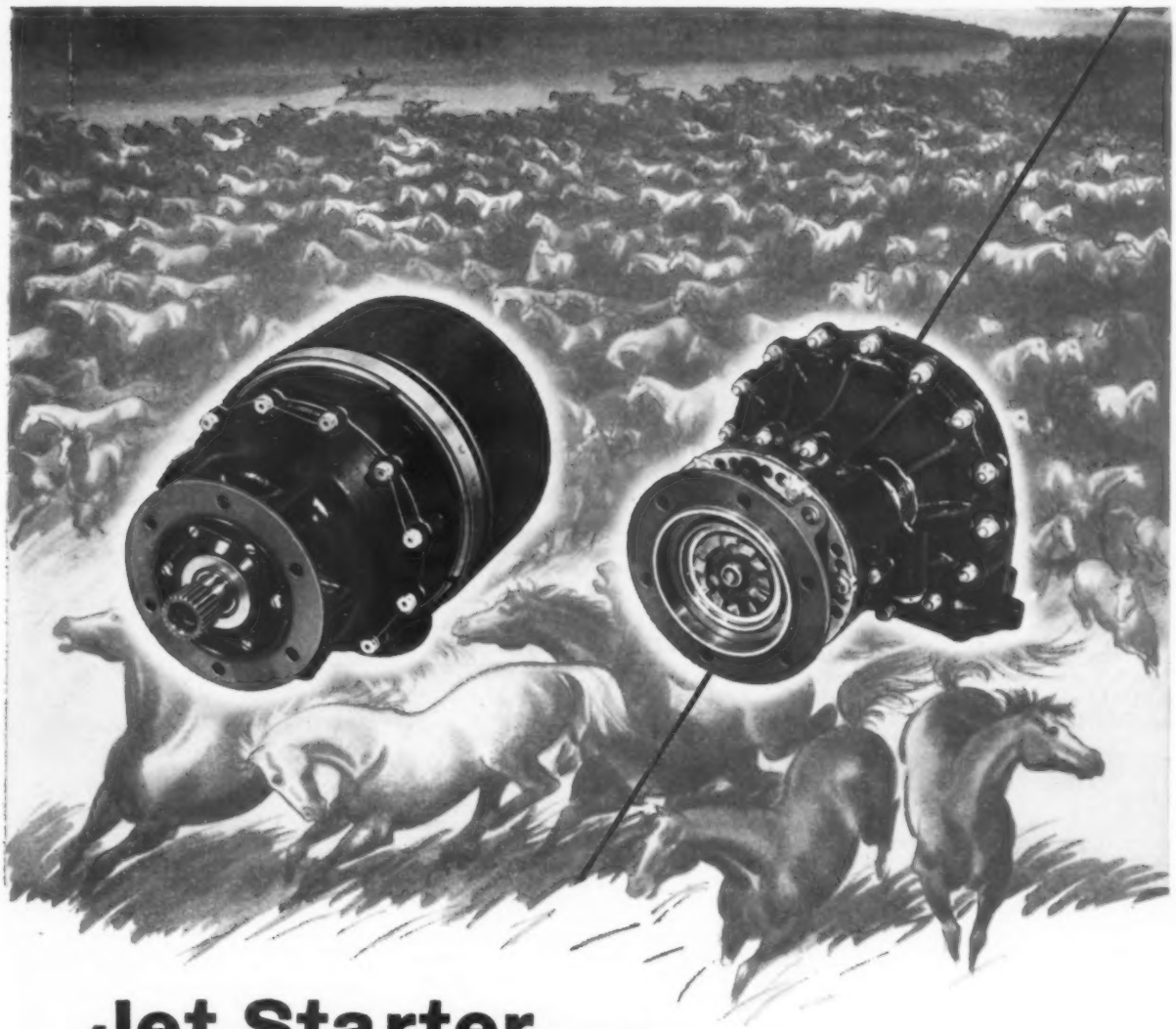
A. K. Rozawick, Pres.

AIRLINE EQUIPMENT CORP.

N. Y.—CIRCLE 5-6920

NEWARK AIRPORT, NEWARK, N. J.

MARKET 2-0963-4



Jet Starter...

FOUR TIMES THE HORSEPOWER...LESS THAN TWICE THE WEIGHT!

At right (above) you see the *first* air turbine starter able to give continuous starts. This was pioneered by AiResearch in 1948. It weighed 17 lbs., produced 35 hp. and was used to start one of America's first turboprop engines: the Allison T-40.

But even then giant jet engines designed to produce 10,000 lbs. of thrust were on the drafting boards. Starting requirements were four times that of earlier jet engines. Could AiResearch create and manufacture such a starter, asked the Air Force.

AiResearch could — and did!

The answer is the unit at the left (above). Weighing only 27.5 lbs. and only slightly larger than the original model, it develops 140 hp. It is the only 140 hp. starter rugged enough to receive *unqualified* approval under Air Force qualification tests: MIL-E-5866A and MIL-E-5272!

Behind AiResearch starters are over 10,000 hours of operation in the laboratory and they have already produced over 100,000 successful starts in the field . . . evidence of the ability of AiResearch to deliver unusual power in small, light-weight packages.

AiResearch Manufacturing Company

A division of THE GARRETT CORPORATION *Los Angeles 45, California • Phoenix, Arizona*

Designers and manufacturers of aircraft components: REFRIGERATION SYSTEMS • PNEUMATIC VALVES AND CONTROLS • TEMPERATURE CONTROLS CABIN AIR COMPRESSORS • TURBINE MOTORS • GAS TURBINE ENGINES • CABIN PRESSURE CONTROLS • HEAT TRANSFER EQUIPMENT • ELECTRO-MECHANICAL EQUIPMENT • ELECTRONIC COMPUTERS AND CONTROLS

International Aviation

By Anthony Vandyk

French government keeps comparative fuel consumption data for transports

OPERATING or having operated almost every type of transport, the French airlines have an unrivaled experience with the various models. The French government keeps comprehensive statistical records of all phases of airline operation. The result is that unusually complete comparative data is available pointing up many advantages and disadvantages.

Take, for instance, fuel consumption. By dividing the number of hours flown by the various French airline transports into the amount of fuel used by each, average hourly fuel consumption figures have been worked out which, in many cases, vary considerably from estimates in manufacturers' brochures.

The following figures refer to all French commercial transport operations in 1953, excluding those for aircraft based in Indo-China.

Type	No. of Engines	Fuel Consumption (Gallons per hour)
Comet	4	1220
Armagnac	4	550
Super Constellation	4	480
Constellation	4	400
DC-6B	4	380
Viscount	4	360
Breguet Deux Ponts	4	350
DC-4	4	220
Boeing 307 Stratoliner	4	220
Bretagne	2	170
C-46	2	170
DC-3	2	100
Junkers Ju 52	3	90
Heron	4	40
Caudron Goeland	2	20

Postscript

As a postscript to the last issue's INTERCOM it is of interest to learn that the Swiss government has filed manslaughter and criminal negligence charges against the pilot and co-pilot of the Swissair Convair 240 which crashed in the sea off the English coast this summer. Three of the passengers were drowned as a result of this accident which happened because the aircraft was not refueled before taking off from Geneva on its flight to London. The two pilots are to be prosecuted for manslaughter and criminal negligence in failing to see that the plane had an adequate fuel supply and failing to help in the rescue of the passengers.

PRODUCTION BRITANNIAS now make an impressive sight in the vast Bristol assembly hall. The Proteus turboprops are not fitted in this hall which accounts for the engineless state of the planes in this photo.

BRIEFS FROM AROUND THE WORLD

Manufacturing

France—France is moving ahead in the lightweight fighter field. Two prototypes each of the Breguet Taon and the Dassault models have been ordered. The latter, a delta-wing design, is due to fly next spring as is the Dassault Mystere 20, an improved (Mach 1.3) version of the Mystere 4 with an Avon RA14 . . . SNCA du Nord has delivered 35 of the 110 NC 856 Norvigie observation planes ordered for the French Army; production is currently 10 aircraft per month.

Japan—Kawasaki company has delivered three liaison planes to the embryo Japanese Air Force. Priced at $36,000 (without radio or spares), the aircraft seems to be an attractive export item . . . Another Japanese firm, Toyo Aircraft, has made the nation's first postwar aircraft sale by exporting four of its license-built Fletcher FD-25's to Cambodia.

Military

Canada—The RCAF is still undecided as to its F-86 replacement. Most observers see the adoption of the F-100 as the most logical development. Nevertheless, the F-104 is attracting the RCAF's attention. An RCAF test pilot who was recently evaluating the F-100 at Muroc expressed interest in the F-104 and said that he intended to make arrangements to return to test the Lockheed fighter. Nevertheless, whether it is the F-100, the F-104, or some other model, the RCAF's next day interceptor is certain to be built by Canadair Ltd., which is now approaching the end of its F-86 production run. The RCAF took delivery of six Sikorsky S-55 helicopters last month and will get two more this month and another two in November.

Airlines

Canada—A great interest is being shown in the first meeting of IATA's new Helicopter Committee in Montreal November 10-13. Among those attending will be representatives of three U.S.-certificated helicopter operators (even though none of them is a member of IATA). It is expected that the discussion will cover such subjects as the size of the helicopter the airlines want, air traffic control, noise, heliports, operational requirements and performance, legal aspect of helicopter operations, specialized navigation aids, and personnel licensing requirements.

Britain—BOAC has reported a net profit of $2,982,111, a corporation record, for its fiscal year through March 31, 1954. It resulted from (1) increased efficiency, (2) reduced operating costs, and (3) an aggressive sales drive. Despite the grounding of the Comets, BOAC is still in the black. Chairman Sir Miles Thomas has stated that it would be wrong to assume that the Comet will be back in a short time. "When the Comet returns it has to be right in order fully to justify public faith in what it can do," he declared.

Germany—The four Convair 340's for Deutsche Lufthansa are off the line and are awaiting clearance for delivery. The first of the airline's four Super Constellations is taking shape and is scheduled to be ready for delivery about March. It has been decided that, initially, Lufthansa will have only two Convair 340 routes—a circular service Hamburg-Dusseldorf - Frankfurt - Paris-London-Hamburg, and a Hamburg-Frankfurt-Madrid run.

there goes the Regulus—

and it's

ALLISON POWERED!

In these days of watchful vigilance, the Navy's pilotless Regulus built by Chance Vought does "triple defense duty."

Powered by Allison's J33 Turbo-Jet engine, the Regulus can be launched from submarine, surface ship or shore base.

In addition, the Regulus, in its test and drone versions, is designed to be "recoverable" — can be launched, then guided to a safe landing following completion of its mission.

The Regulus delivers maximum defense at multiple savings: (1) It can be utilized for a variety of purposes without the expense and effort of designing and building a separate missile for each requirement. (2) Its Allison engine is designed, manufactured and tested with considerable savings in critical materials and man-hours—without sacrifice of maximum reliability during its operational life.

GM GENERAL MOTORS

Allison

Division of General Motors, Indianapolis, Indiana

World's most experienced designer and builder of aircraft turbine engines—J71 and J35 Axial, J33 Centrifugal Turbo-Jet Engines, T56, T38 and T40 Turbo-Prop Engines

EN ROUTE . . .

WAYNE W. PARRISH

"Death in the Afternoon"

TEN miles north of Seville the Spanish are gradually uncovering the ruins of an ancient Roman town called Italica.

Back in the first and second centuries after Christ it was an important place. The Roman emperors Trajan, Hadrian, and Theodosius I were born there. So was the poet Silius Italicus. The main street was five miles long.

Today you can stand on the original stone-block paving of this main street and picture what this ancient town must have looked like. The curbing is there and so are the foundations of the houses and buildings and the alleys and sidestreets. The original mosaic flooring of many houses is intact.

What you won't see are the mosaic designs which the Romans used in some rooms of their houses. By today's standards they are pornographic, and the Spanish government takes pains to destroy every such design as soon as it is uncovered. This is unfortunate for the historians because here is a remarkably well-preserved city. Much remains to be uncovered. Most of it is still under eight feet of earth.

It was only a few decades ago that the old city was discovered, and this was due to the fact that the Roman Circus, an amphitheater which could seat 25,000 persons, formed an outcropping in a field of olive trees. One thing led to another until now it is known that this is one of the finest Roman ruins to be found anywhere.

"Sport" in the 2nd century

The amphitheater was remarkably well built, and is well preserved. It has a feature not found in other such monuments. In the center of the arena the Romans dug out a long, deep, rectangular crevice which was filled with water for some of the games. When not in use, the pool was covered over with wooden planks.

They must have had a lot of fun in those days. It is known that human beings would be thrown into the water to wrestle with alligators and other aquatic animals and of course the humans lost out, as was intended. It was a water version of the sport of throwing Christians to the lions as in Rome. In those days there seemed to be no compunction whatever toward using human beings as sacrifices, and the populace obviously got a tremendous thrill out of seeing limbs torn from bodies.

Today, only 10 miles to the south is the picturesque, modern city of Seville along the Quadalquiver River where over 400,000 people live—certainly one of the most attractive cities in the world. The Moorish influence, dating from 700 years of Moslem occupancy after the Romans departed, is quite evident in the architecture of the old buildings. The Moorish influence on music in all of Andalucia is also quite evident. Through the thousands of years the composition of the populace has remained about the same, taking into consideration the mixtures of blood of the various occupying powers, of course.

"Sport" in the 20th century

In the center of Seville is a big bullring. It seats about 25,000. During the *Feria* week the greatest matadors of the world are feature attractions. The bullring is crowded every day and good tickets are difficult to obtain.

In 1931, on my first visit to Spain, I saw a full afternoon of bullfights in Madrid. I decided then that I would never see another one. But this year, what with the big stars and all during Seville's big fiesta, I gave in. I joined the thousands and got a seat for the gala performance which began at 5 o'clock in the afternoon.

I won't attempt to use proper terms because I have no interest in doing any further research on bullfights. But the performers—whether they be matadors or picadors or whatnot—were outlandishly dressed. The costumes were brilliant. I will also say that the cape work when the bulls came out into the arena was impressive and interesting.

But the remainder of the performance, in my estimation, was barbaric in its most stupid and senseless form. There is no sportsmanship whatever. And of the seven bulls killed, not one died by a direct plunge of the sword. Death was prolonged over a long period of time, first by the darts and then by the clumsy work by the matadors. I have never shied away from blood, but looking at blood and slow-dying animals for several hours is not my idea of pleasure.

And the horses? I have often heard that bullfights are "civilized" now because the horses are protected by padding. Sure. But one bull got his horns underneath the padding of one hapless, blinded horse, gored it, upset it, and the arena flunkies had to kill it and drag it out of the arena to its sudden reward. Wonderful sport, the kind that brings out bravery. In a pig's eye!

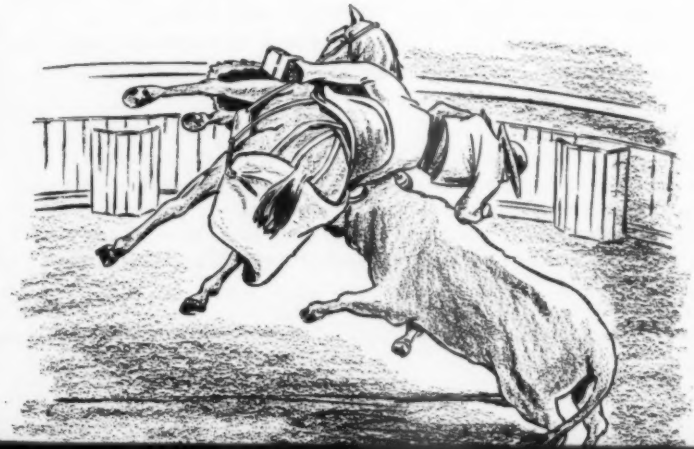
Only the locale has changed

One of the birds who was doing cape work had his cape snagged by a bull and the bull started after him. He ran (those brave performers sure can run!) and made a leap over the barrier but he wasn't fast enough. One horn caught him just where he sits down. The luckless guy was carried out to a hospital and the bull, with six or eight inches of human blood on his horn, carried on until he, too, fell clumsily to his knees, rolled over, and was dragged out.

Several days later the most popular matador, a Venezuelan whom I watched on my day at the "fight," was caught by a bull and was very seriously (and probably permanently) injured in the spine.

Italica, 10 miles north of the river, was a thriving city in 200 A.D. The people liked to see human beings fight losing battles with alligators. Times do change, but only relatively. The basic thrill in seeing cruelty, pain, blood, and slow death remains. The locale has merely moved 10 miles in 17 centuries.

• • •



for use ... at 60° below

The CF-100 with its ORENDA's was meant to fly and fight in the Arctic. So that's where it's been tested. In the bitter wind-searing cold, engines must start, controls move, radio be clear, guns fire, and the pilot's hands and feet be comfortable within minutes after a "Barren Land" alert.

It's routine now to leave a CF-100 out overnight with but a light wrap to keep the wings clear of frost. After a 15-hour "cold soak" in temperatures of 30° to 60° below they pull the wraps, flick switches and take off. If it's not cold enough at Namao, near Edmonton, they fly non-stop to Fort Churchill on Hudson's Bay.

Defender of the Arctic, the CF-100 is in squadron service with the R.C.A.F. at strategic bases. On daily flights, it probes the perimeter of those areas most likely to need watching.

This CF-100 has had overnight "Cold Soak".

CF-100, WORLD FLIGHT RECORD—*the 2100 miles from Vancouver to North Bay was recently flown non-stop by a CF-100 in 3 hours, 50 minutes at 550 M.P.H. Piloted by F/L M. Kobierski with F/L D. Turner, Navigator, this was one of many tests performed by the CF-100's of 445 All Weather Squadron, R.C.A.F., Uplands, Ontario. It is the longest non-stop flight completed by a fighter aircraft.*

Ground Crew enjoys heat from quick starting OREND.

AIRCRAFT DIVISION

A.V. ROE CANADA LIMITED

MALTON, ONTARIO

MEMBER OF THE HAWKER SIDDELEY GROUP

AVRO CANADA

the bulletin board

Undisplayed Advertising: $1.00 per line, minimum charge $4.00. Cash with order. Estimate 30 capital letters and spaces per line; 40 small lower-case letters and spaces per line. Add two lines if Box Number is included in lieu of advertiser's name and address.

Displayed Advertising: $15.00 per column inch. Space units up to full pages accepted in this section for classified-type advertising.

Forms close three weeks preceding date of issue. Address all correspondence to Classified Advertising Department, American Aviation Publications, 1025 Vermont Ave., N. W., Washington 5, D. C.

SUPER-92
over 200 mph for your DC-3
CAA Approved—better single engine—lower costs
Fully interchangeable with —92
ENGINE WORKS
Lambert Field Inc. St. Louis, Mo.

EXECUTIVE AIRCRAFT
Complete Services and Sales
DC-3 Lodestar D18S

Inc. of ST. LOUIS **REMMERT-WERNER** Inc. of TOLEDO

RAS INCORPORATED READING, PA.
ELECTRONIC SPECIALISTS
Custom Installations of
ARC . . . BENDIX . . . COLLINS
LEAR . . . NARCO . . . ECLIPSE . . . SPERRY
READING AVIATION SERVICE, INC.
MUNICIPAL AIRPORT READING, PA.

HELP WANTED

CHIEF REVENUE ACCOUNTANT for rapidly expanding local service carrier. Airline revenue experience required. Must be capable of taking full charge of revenue accounting department. State qualifications and salary expected. Box 889, AMERICAN AVIATION Magazine, 1025 Vermont Avenue, N. W., Washington 5, D. C.

ATTENTION ENGINEERS

Aeronca Manufacturing Corporation, a leading sub-contractor for the aircraft industry has immediate openings in its new research and development group for engineers qualified in

Applied Aerodynamics
Flight Control Systems
Aircraft Structures
Propulsion Systems
Electronics

Build your career with an expanding progressive company where advancement is assured for engineers with ability and initiative. If you have three or more years' experience, a basic or advanced engineering degree, and are capable of original development activity in aircraft and missile systems, you are invited to contact our Personnel Office at 1712 Germantown Road, Middletown, Ohio.

NAVCO INC. Lambert Field St. Louis, Mo. TErryhill 5-1511
Has all Parts and Supplies for Executive DC-3 LODESTAR BEECH
Airframe Engines Radios
A.R.C. Bendix Collins Lear Sperry Wilcox
P&W Continental Wright Goodrich Goodyear

WANTED
SURPLUS AIRCRAFT PARTS
or termination inventories.
Get our cash offer by return mail.
Send lists to:
COLLINS ENGINEERING COMPANY
9050 Washington Blvd., Culver City, Calif.

We buy DC-3 and C-47
—also fuselages, center sections, components, etc. Prefer runout or needing work. Airline, passenger, cargo, Wright, Pratt & Whitney, etc. State Price, time, quantity, type engines.
We are not brokers
Remmert-Werner, Inc., Lambert Field, St. Louis, Mo.

WANTED
SURPLUS ROD & BAR
Stainless - Aluminum - Steel - Brass Any Size; type and quantity.
Cash for termination inventories.
Send lists to:
COLLINS ENGINEERING COMPANY
9050 Washington Blvd., Culver City, Calif.

REMMERT-WERNER, Inc.
Lambert Field St. Louis, Mo.
offer your choice of

1 DAY	2 DAY	3 DAY
100 hour INSPECTIONS	. . OR . . for	100 hour OVERHAULS
BEECHCRAFT	DC-3	LODESTAR

Want facts about
WHO'S WHO IN WORLD AVIATION?
Write Dept. M. American Aviation Publications, 1025 Vermont Ave., N. W., Washington 5, D. C.

The Demon
ENGINEERS
Needed for assignments in
Airplane
Helicopter
Missile Engineering

Aerodynamicists
Stress Engineers
Design Engineers
Dynamicists
Flight Test Engineers
Missile Electronics Men
Thermodynamicists
Technical Illustrators

We also have a limited number of positions available for recent college engineering graduates.

Relocation assistance to qualified applicants—good housing available.

Address inquiries to:
Technical Placement Supervisor
Box 516, St. Louis 3, Missouri

McDONNELL *Aircraft Corporation*
ST. LOUIS 3, MO.

American Aviation

Reader Service

- USE THE PREPAID reply cards on this page for full information about any product or service advertised in AMERICAN AVIATION.

To get this data, fill out page numbers in spaces provided on card. If more than one advertiser appears on a page, please fill in advertiser's name.

- FOR INFORMATION concerning New Products, Technical Literature, or equipment mentioned in the editorial pages of this issue:

Please circle the numbers shown on the reply card which correspond to the numbers appearing beneath the items described in AMERICAN AVIATION.

- YOUR REQUESTS for information will be forwarded promptly to the companies concerned.

INDUSTRY AIDS FOR THE ASKING

Useful literature, films, etc. on a variety of technical and engineering subjects . . . free unless otherwise noted.

GRAPHIC DISPLAYS. Broadmaster visual control board for such applications as production control, budgeting, scheduling, is fully illustrated in 23-page catalog. Graphic Systems, Inc.
Circle No. 1 on Reader Service Card.

STEPPING RELAYS. Bulletin P-84 contains a 12-page description of midget, high-speed, vibration resistant, and interlock-type stepping relays. Guardian Electric Mfg. Co.
Circle No. 2 on Reader Service Card.

LUMINOUS PLASTICS. An 8-page brochure prepared by Luminous Resins, Inc. lists applications of injection molded, extruded, or compression molded luminescent plastics.
Circle No. 3 on Reader Service Card.

POLYESTER FILM. Technical reports describing Mylar polyester film and adhesive TR-2 for bonding it to other materials are available from E. I. DuPont de Nemours & Co.
Circle No. 4 on Reader Service Card.

ELECTRONIC COUNTERS. Potter Instrument Co. has issued a 20-page booklet on equipment and techniques for controlling industrial equipment with predetermined electronic counters.
Circle No. 5 on Reader Service Card.

POLY-V DRIVE. Brochure 6638 published by Raybestos-Manhattan, Inc., Manhattan Rubber Division, compares the Poly-V drive with conventional V-belt drives.
Circle No. 6 on Reader Service Card.

WIRE & CABLE. Seventeen technical bulletins containing specifications for plastic insulated miniature and subminiature wire and cable are included in brochure by Tensolite Insulated Wire Co., Inc.
Circle No. 7 on Reader Service Card.

PARTS CLEANER. Use of new cold immersion carburetor and engine parts cleaner is outlined in leaflet prepared by Curran Ordnance Chemical Laboratory.
Circle No. 8 on Reader Service Card.

TEST EQUIPMENT. Consolidated Engineering Corp. describes its Type 1-110B vibration meter and type 5-116 recording oscillograph in bulletins CEC-1505C and 1521A.
Circle No. 9 on Reader Service Card.

ELECTRICAL TESTER. A 4-page brochure published by Sensitive Research Instrument Corp. gives details on its new Model C d-c standard Polyranger.
Circle No. 10 on Reader Service Card.

HIGH-SPEED BROACHING. Bulletin HM-54 covers high-speed surface broaching operations using mechanical horizontal broaching machines. Colonial Broach Co.
Circle No. 11 on Reader Service Card.

TEST STANDS. Vis-O-Line test stands and control panels are the subject of a 6-page folder. Industrial Engineering Corp.
Circle No. 12 on Reader Service Card.

TITANIUM BOLTS. H. M. Harper Co., Aero Division. Manual of specifications and prices on over 800 sizes and styles of titanium bolts and screws.
Circle No. 13 on Reader Service Card.

MINIATURE CONNECTORS. Bulletin SR-KMI available from Cannon Electric Co. provides engineering data on the Cannon K series of miniature connectors.
Circle No. 14 on Reader Service Card.

SIGNAL GENERATORS. Complete line of instrument and signal source generators produced by Electrical Indicator Co. are illustrated in 24-page catalog EI-1A.
Circle No. 15 on Reader Service Card.

D-C SOLENOIDS. A 4-page brochure issued by Joseph Pollack Corp. describes its series 100 and 300 d-c solenoids.
Circle No. 16 on Reader Service Card.

PRINTED CIRCUITRY. H. H. Buggie, Inc. An 8-page catalog on printed circuit connectors.
Circle No. 17 on Reader Service Card.

WIRE & TUBING. Catalog No. 54 lists complete line of Turbo Products produced by William Brand & Co.
Circle No. 18 on Reader Service Card.

Postage Will Be Paid by Addressee

BUSINESS REPLY CARD
First Class Permit No. 2455-R (Sec. 510 P.L.& R.) Washington, D.C.

READER SERVICE DEPT.
AMERICAN AVIATION
New York Airport Station 71,
New York

No Postage Stamp Necessary If Mailed in the United States

AMERICAN AVIATION
Reader Service Card

Expires 30 days after Oct. 11, 1954

(After that write on letterhead describing data wanted)

- SEND ME INFORMATION ON THESE ADVERTISE PRODUCTS/SERVICES

Page Number —— —— —— —— —— ——

Name of Advertiser .....
(If more than one ad on page)

- CIRCLE NUMBERS BELOW FOR INFORMATION ON NE PRODUCTS, TECHNICAL LITERATURE, EQUIPMENT O SERVICES MENTIONED IN THIS ISSUE.

1	2	3	4	5	6	7	8	9	10	11	1
13	14	15	16	17	18	19	20	21	22	23	2
25	26	27	28	29	30	31	32	33	34	35	3
37	38	39	40	41	42	43	44	45	46	47	4
49	50	Other:									

Name: .....

Title/Position: .....

Company: .....

Address: .....

City ..... Zone ..... State .....

CARD MUST BE FILLED IN COMPLETELY. PLEASE TYPE OR PRINT
(Additional postage required if mailed outside of U. S. A.

AMERICAN AVIATION
Reader Service Card

Expires 30 days after Oct. 11, 1954
(After that write on letterhead describing data wanted)

- SEND ME INFORMATION ON THESE ADVERTISED PRODUCTS/SERVICES

Page Number —— —— —— —— —— ——

Name of Advertiser .....
(If more than one ad on page)

- CIRCLE NUMBERS BELOW FOR INFORMATION ON NEW PRODUCTS, TECHNICAL LITERATURE, EQUIPMENT OR SERVICES MENTIONED IN THIS ISSUE.

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48
49	50	Other:									

Name: .....

Title/Position: .....

Company: .....

Address: .....

City ..... Zone ..... State .....

CARD MUST BE FILLED IN COMPLETELY. PLEASE TYPE OR PRINT.
(Additional postage required if mailed outside of U. S. A.)

No Postage Stamp Necessary If Mailed in the United States

BUSINESS REPLY CARD
First Class Permit No. 2455-R (Sec. 510 P.L.& R.) Washington, D. C.

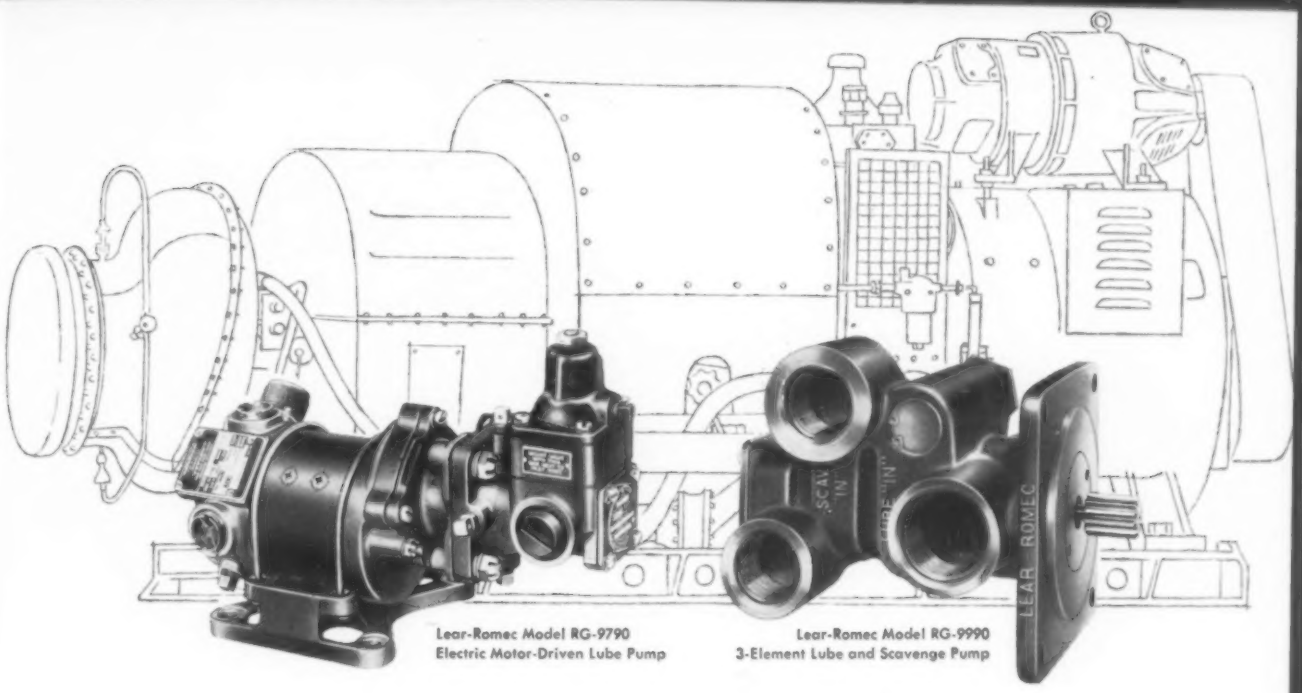
READER SERVICE DEPT.
AMERICAN AVIATION
New York Airport Station 71,
New York

Postage Will Be Paid by Addressee

ADVERTISERS IN THIS ISSUE

AiResearch Mfg. Company, Div. of The Garrett Corporation 71
Allison Division, General Motors Corporation 73
American Airlines, Inc. 61
B G Corporation, The 66
B & H Instrument Company, Inc. 64
Bendix Aviation Corporation
Eclipse Pioneer Division 39
Scintilla Division 63
Braniff Airways, Inc. 57
Bulletin Board (Classified) 76
Capital Airlines, Inc. 5
Chandler-Evans, Div.
Niles-Bement-Pond Company 27
Classified Advertising 76
Collins Radio Company 31
CONVAIR—A Division of General Dynamics Corporation 14
Chance Vought Aircraft, Inc. 16
de Havilland Aircraft of Canada Limited, The 6
Douglas Aircraft Company, Inc. 65
Fairchild Engine & Airplane Corporation
Aircraft Division 62, 70
Stratos Division 9
Flightex Fabrics, Inc. 6
Gilfillan Bros., Inc. 51
B. F. Goodrich Company, The 18
Grand Central Aircraft Company 40, 41
Hertz Driv-Ur-Self System, Inc. 13
Hardman Tool & Engineering Company 10
Hollywood Roosevelt Hotel 32
Lear, Inc. 79
Hotel Lexington 56
Lockheed Aircraft Corp. 48, 49
Minneapolis-Honeywell Regulator Company,
Aeronautical Division 2
Monsanto Chemical Company 69
Northrop Aircraft, Inc. 11
Phillips Petroleum Company 80
Republic Aviation Corporation 59
A. V. Roe Canada Limited 75
Scott Aviation Corporation 54
Shell Oil Company 67
Simmonds Accessories, Inc. 56
Sinclair Refining Company 44, 45
Solar Aircraft Company 7
Southwest Airmotive Company 8
Summers Gyroscope Company 54
Speery Gyroscope Company,
Div. of The Sperry Corporation 55
Temco Aircraft Corporation 12
Twin Coach Company, Aircraft Division 37
Western Air Lines, Inc. 68
Western Gear Works 33

ACKNOWLEDGMENTS: Cover—Douglas; 19—Douglas; 21—British Information Services, SAS; 22—Short Bros. & Harland Ltd.; 23—British Information Services; 30—WADC, Aerojet-General; 34-35—Douglas; 46—Norman Larson Co., McKinnon-Hickman; 47-50—Idaho Operations Office; 62—National Airlines; 72—Bristol.



Lear-Romec Model RG-9790
Electric Motor-Driven Lube Pump

Lear-Romec Model RG-9990
3-Element Lube and Scavenge Pump

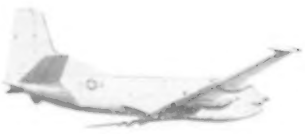
How to meet critical "lube" problems of gas turbines

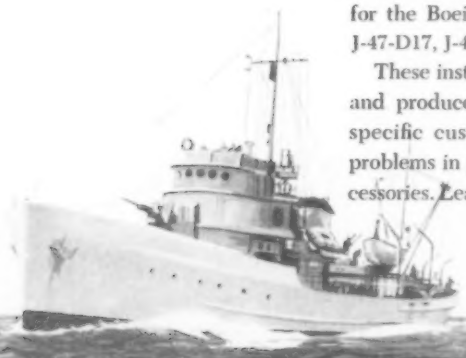
Solar Aircraft Company does it with two Lear-Romec pumps in its "Jupiter" 500 hp gas turbine Auxiliary Power Unit, designed to provide emergency power aboard American Naval ships.

One Lear-Romec electric pump drives oil to the Jupiter's "hot box" compressor and turbine shaft bearings and to its reduction gears during starting and speed-up. As the turbine comes up to 20,000 rpm running speed, a second, specially designed Lear-Romec engine-driven pump takes over. With rated capacity of 9 gpm at 50-60 psi, this pump forces a quart of oil per minute through each shaft bearing and through each lubrication point in the gearbox, simultaneously returning the oil from bearings and gears to the oil reservoir through two scavenge elements.

Lear-Romec has also designed and built lube pumps for Solar's featherweight "Mars" 50 hp gas turbine, which is used to drive APU's in Douglas C-124 and Lockheed Super Constellation transports. In addition, Lear-Romec has designed and built pumps for the Boeing 502 utility gas turbine, and for General Electric J-47-D17, J-47-E27, J-73-7 and J-79 jet aircraft powerplants.

These installations are typical of Lear-Romec's ability to design and produce liquid and air pumps and associated products to specific customer needs. Lear-Romec invites *your* problems in pumps and other special purpose fluid accessories. Lear Inc., Lear-Romec Division, Elyria, Ohio.



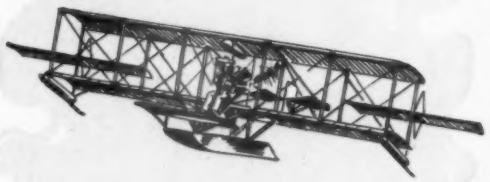


LEAR LEAR-ROMEC DIVISION

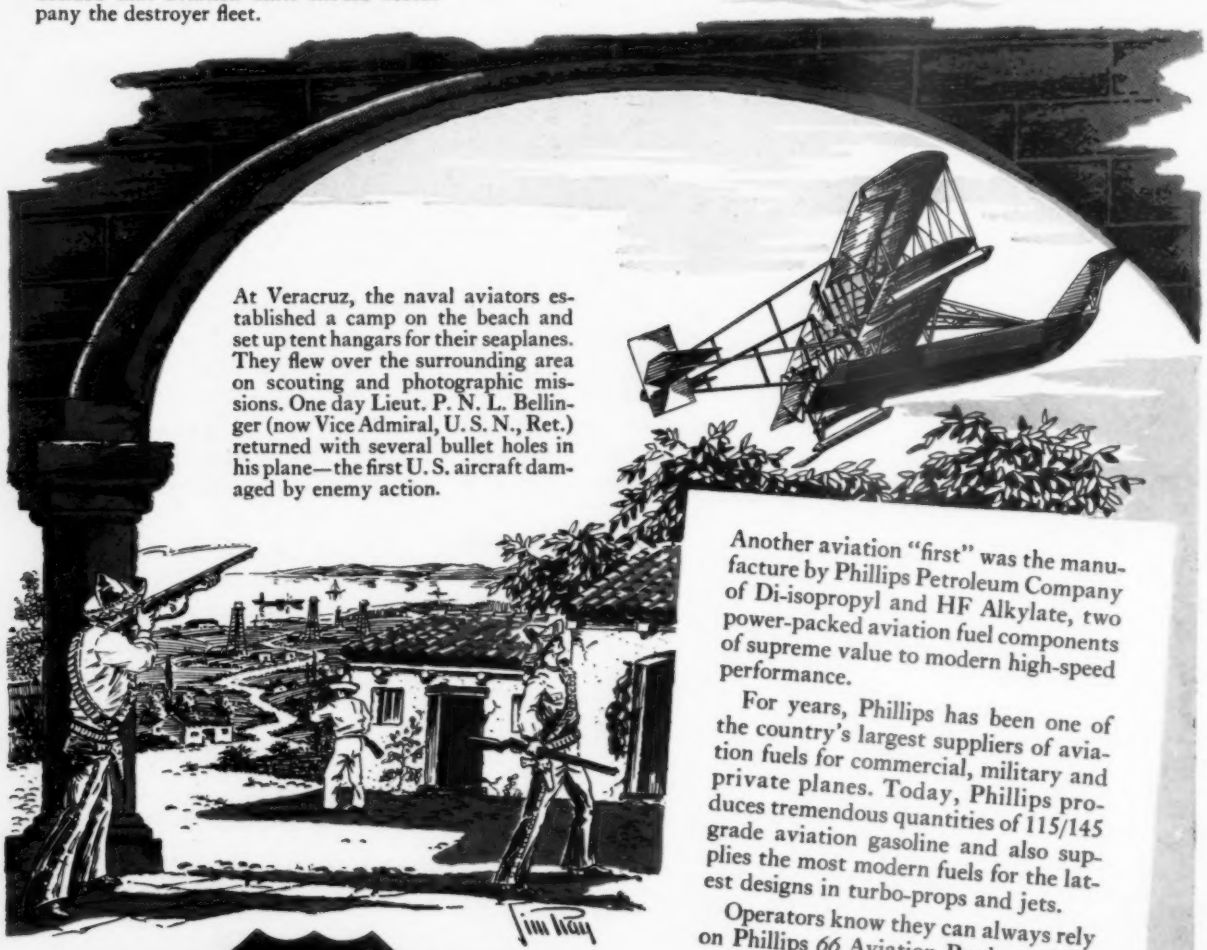
Phillips 66
PRESENTS

MILESTONES IN AVIATION

The "Eyes of the Fleet" Go into Action



Very early, U. S. Navy airplanes demonstrated their ability to serve as "The Eyes of the Fleet." In 1914, revolutionary outbursts in Mexico caused President Wilson to dispatch naval vessels to Mexican ports. At the urging of enthusiastic naval aviators, it was decided that aviation units should accompany the destroyer fleet.



At Veracruz, the naval aviators established a camp on the beach and set up tent hangars for their seaplanes. They flew over the surrounding area on scouting and photographic missions. One day Lieut. P. N. L. Bellinger (now Vice Admiral, U. S. N., Ret.) returned with several bullet holes in his plane—the first U. S. aircraft damaged by enemy action.

Another aviation "first" was the manufacture by Phillips Petroleum Company of Di-isopropyl and HF Alkylate, two power-packed aviation fuel components of supreme value to modern high-speed performance.

For years, Phillips has been one of the country's largest suppliers of aviation fuels for commercial, military and private planes. Today, Phillips produces tremendous quantities of 115/145 grade aviation gasoline and also supplies the most modern fuels for the latest designs in turbo-props and jets.

Operators know they can always rely on Phillips *66* Aviation Products, long noted for quality and efficiency.

AVIATION DIVISION
PHILLIPS PETROLEUM COMPANY
BARTLESVILLE, OKLAHOMA

AVIATION PRODUCTS